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A TRANSLATION OF FREGE'S *UEBER SINN UND BEDEUTUNG*

Introductory Note ..... MAX BLACK 207

Sense and Reference ..... GOTTLOB FREGE 209

DONALD WILLIAMS' THEORY OF INDUCTION ... FREDERICK L. WILL 231

THE PRAGMATIC THEORY OF SCIENTIFIC OBJECTS .. W. M. SIBLEY 248

DISCUSSION

C. I. Lewis' Analysis of Knowledge and Valuation ..... C. J. DUCASSE 260

REVIEWS OF BOOKS 281

Robert H. Heywood (ed.), The Works of the Mind; by George H. Sabine—*Harold Cherniss*, Aristotle's Criticism of Plato and the Academy, I; by Friedrich Solmsen—*Executive Committee of the Cooperative Study in General Education*, Cooperation in General Education, and *Harold Baker Dunkel*, General Education in the Humanities; by Raphael Demos—*Auguste Brunner*, La Personne incarnée; by Sven Nilson—*Paul Ortegat*, Intuition et religion; by Stuart M. Brown, Jr.—*Daniel J. Bronstein, Yervant H. Krikorian*, and *Philip P. Wiener*, Basic Problems of Philosophy; by W. H. Hay.

BOOKS RECEIVED 296

NOTES 300

The Jerusalem Historical and Philosophical Society. Carus Lectures. A correction. Articles in Current Philosophical Periodicals.

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A TRANSLATION OF FREGE'S *UEBER SINN UND BEDEUTUNG*

Introductory Note

THE LOGICAL and mathematical writings of Gottlob Frege are gradually emerging from undeserved neglect. After a lapse of half a century, it is becoming generally recognized that his views on topics of fundamental importance in the foundations of mathematics and the philosophy of symbolism deserve very serious attention. And many feel that where Frege's judgment differs from the more generally received doctrine he is more likely to be right than his opponents. This process of revaluation would be hastened if Frege's writings were more generally accessible.

It has therefore seemed worthwhile to translate his famous paper on "Sinn und Bedeutung," published in 1892 in the *Zeitschrift für Philosophie und philosophische Kritik* (vol. 100, pp. 25–50).

The point of central interest is Frege's distinction between sense (*Sinn*) and designation or denotation or, as I have chosen to call it, reference (*Bedeutung*). This corresponds, in some measure, to a distinction which other philosophers have made between *connotation* and *denotation*, or *intension* and *extension* (or even *description* and *acquaintance*). But Frege's distinction is not to be identified with any of these. I doubt that many philosophers would accept Frege's demonstration that the referent of a declarative sentence is either *the true* or *the false*; or that many will sympathize with his dogged persistence in examining the relevance of his distinction to the manifold types of subordinate clauses which may be exemplified in complex sentences. But if his doctrines occasionally seem implausible, they always deserve detailed refutation; and the effort of following his argument is rewarded by flashes of penetrating insight.

In trying to prepare a *literal* translation which will not sound foreign, one runs into obvious difficulties. In the present instance, these are aggravated by the novelty of Frege's ideas and the consequent lack of a settled terminology for their expression. (Thus some may object to my choice of "refer to" for *bedeuten* and "referent" for *Bedeutung*. But "denote" is misleading, "designatum" clumsy, and "nominatum" —Carnap's suggestion—too new for general acceptance.) The trans-

lator is also harassed by Frege's fondness for parenthetical qualifications and his liberal use of untranslatable German particles. I have tried to be faithful to Frege's intentions, even at the cost of occasional clumsiness.

The following is a list of the chief terms used by Frege in *technical senses* (often diverging from common meanings of the words) together with the English equivalents chosen.

Anschauung	Experience
Art des Gegebenseins	Mode of presentation
Bedeutung	Reference [for the process] Referent [for the object]
Begriff	Concept or predicate
Begriffsausdruck	Predicate expression
Behauptungssatz	Declarative sentence
Bezeichnung	Designation
Bild	Representation
Eigenname	Proper name
Erkenntniswerth	Cognitive value
Gedanke	Thought [a sense peculiar to F., for which Proposition has also been suggested]
Gedankentheil	Part of a thought
Gewöhnliche Bedeutung	Customary reference
Hauptsatz	Main clause
Nebensatz	Subordinate clause
Sinn	Sense
Satz	Sentence or clause [according to context]
Unbestimmt andeutender Bestandtheil	Indefinite indicator [corresponds approximately to "variable" in modern usage]
Vorstellung	Conception
Warheitswerth	Truth value

The footnotes are Frege's own, except for five interpolated comments, shown by the use of small capital letters as markers. Marginal numbers indicate the original pagination.

Cornell University MAX BLACK

SENSE AND REFERENCE

By GOTTLOB FREGE

25 Identity[1] gives rise to challenging questions which are not altogether easy to answer. Is it a relation? A relation between objects, or between names or signs of objects? In my *Begriffsschrift*[A] I assumed the latter. The reasons which seem to favor this are the following: $a=a$ and $a=b$ are obviously statements of differing cognitive value; $a=a$ holds a priori and, according to Kant, is to be labeled analytic, while statements of the form $a=b$ often contain very valuable extensions of our knowledge and cannot always be established a priori. The discovery that the rising sun is not new every morning, but always the same, was of very great consequence to astronomy. Even today the identification of a small planet or a comet is not always a matter of course.

26 Now if we were to regard identity as a relation between that which the names "a" and "b" designate, it would seem that $a=b$ could not differ from $a=a$ (i.e., provided $a=b$ is true). A relation would thereby be expressed of a thing to itself, and indeed one in which each thing stands to itself but to no other thing. What is intended to be said by $a=b$ seems to be that the signs or names "a" and "b" designate the same thing, so that those signs themselves would be under discussion; a relation between them would be asserted. But this relation would hold between the names or signs only insofar as they named or designated something. It would be mediated by the connection of each of the two signs with the same designated thing. But this is arbitrary. Nobody can be forbidden to use any arbitrarily producible event or object as a sign for something. In that case the sentence $a=b$ would no longer refer to the subject matter, but only to its mode of designation; we would express no proper knowledge by its means. But in many cases this is just what we want to do. If the sign "a" is distinguished from the sign "b" only as object (here, by means of its

[1] I use this word strictly and understand "$a=b$" to have the sense of "a is the same as b" or "a and b coincide."

[A] The reference is to Frege's *Begriffsschrift, eine der arithmetischen nachgebildete Formelsprache des reinen Denkens* (Halle, 1879).

shape), not as sign (i.e., not by the manner in which it designates something), the cognitive value of $a=a$ becomes essentially equal to that of $a=b$, provided $a=b$ is true. A difference can arise only if the difference between the signs corresponds to a difference in the mode of presentation of that which is designated. Let a, b, c be the lines connecting the vertices of a triangle with the midpoints of the opposite sides. The point of intersection of a and b is then the same as the point of intersection of b and c. So we have different designations for the same point, and these names ("Point of intersection of a and b," "Point of intersection of b and c") likewise indicate the mode of presentation; and hence the statement contains true knowledge.

It is natural, now, to think of there being connected with a sign (name, combination of words, letter), besides that to which the sign refers, which may be called the referent of the sign, also what I would like to call the *sense* of the sign, wherein the mode of presentation is contained. In our example, accordingly, the referents of the expressions
27 "the point of intersection of a and b" and "the point of intersection of b and c" would be the same, but not their senses. The referent of "evening star" would be the same as that of "morning star," but not the sense.

It is clear from the context that by "sign" and "name" I have here understood any designation representing a proper name, whose referent is thus a definite object (this word taken in the widest range), but no concept and no relation, which shall be discussed further in another article.[B] The designation of a single object can also consist of several words or other signs. For brevity, let every such designation be called a proper name.

The sense of a proper name is grasped by everybody who is sufficiently familiar with the language or totality of designations to which it belongs;[2] but this serves to illuminate only a single aspect of the

[B] See his "Ueber Begriff und Gegenstand" in *Vierteljahrsschrift für wissenschaftliche Philosophie* (XVI [1892], 192–205).

[2] In the case of an actual proper name such as "Aristotle" opinions as to the sense may differ. It might, for instance, be taken to be the following: the pupil of Plato and teacher of Alexander the Great. Anybody who does this will attach another sense to the sentence "Aristotle was born in Stagira" than will a man who takes as the sense of the name: the teacher of Alexander the Great who was born in Stagira. So long as the referent remains the same, such variations of sense may be tolerated, although they are to be avoided in the theoretical structure of a demonstrative science and ought not to occur in a complete language.

referent, supposing it to exist. Comprehensive knowledge of the referent would require us to be able to say immediately whether every given sense belongs to it. To such knowledge we never attain.

The regular connection between a sign, its sense, and its referent is of such a kind that to the sign there corresponds a definite sense and to that in turn a definite referent, while to a given referent (an object) there does not belong only a single sign. The same sense has different expressions in different languages or even in the same language. To be sure, exceptions to this regular behavior occur. To every expression belonging to a complete totality of signs, there should certainly correspond a definite sense; but natural languages often do
28 not satisfy this condition, and one must be content if the same word has the same sense in the same context. It may perhaps be granted that every grammatically well-formed expression representing a proper name always has a sense. But this is not to say that to the sense there also corresponds a referent. The words "the celestial body most distant from the earth" have a sense, but it is very doubtful if they also have a referent. The expression "the least rapidly convergent series" has a sense; but it is known to have no referent, since for every given convergent series, another convergent, but less rapidly convergent, series can be found. In grasping a sense, one is not certainly assured of a referent.

If words are used in the ordinary way, one intends to speak of their referents. It can also happen, however, that one wishes to talk about the words themselves or their sense. This happens, for instance, when the words of another are quoted. One's own words then first designate words of the other speaker, and only the latter have their usual referents. We then have signs of signs. In writing, the words are in this case enclosed in quotation marks. Accordingly, a word standing between quotation marks must not be taken as having its ordinary referent.

In order to speak of the sense of an expression "A" one may simply use the phrase "the sense of the expression 'A.'" In reported speech one talks about the sense—e.g., of another person's remarks. It is quite clear that in this way of speaking words do not have their customary referents but designate what is usually their sense. In order to have a short expression, we will say: In reported speech, words are used *indirectly* or have their *indirect* referents. We distinguish

accordingly the *customary* from the *indirect* referent of a word; and its *customary* sense from its *indirect* sense. The indirect referent of a word is accordingly its customary sense. Such exceptions must always be borne in mind if the mode of connection between sign, sense, and referent in particular cases is to be correctly understood.

29 The referent and sense of a sign are to be distinguished from the associated conception. If the referent of a sign is an object perceivable by the senses, my conception of it is an internal image,[3] arising from memories of sense impressions which I have had and activities, both internal and external, which I have performed. Such a conception is often saturated with feeling; the clarity of its separate parts varies and oscillates. The same sense is not always connected, even in the same man, with the same conception. The conception is subjective: One man's conception is not that of another. There result, as a matter of course, a variety of differences in the conceptions associated with the same sense. A painter, a horseman, and a zoologist will probably connect different conceptions with the name "Bucephalus." This constitutes an essential distinction between the conception and the sign's sense, which may be the common property of many and therefore is not a part or a mode of the individual mind. For one can hardly deny that mankind has a common store of thoughts which is transmitted from one generation to another.[4]

In the light of this, one need have no scruples in speaking simply of *the* sense, whereas in the case of a conception one must precisely indicate to whom it belongs and at what time. It might perhaps be said: Just as one man connects this conception and another that conception with the same word, so also one man can associate this sense and another that sense. But there still remains a difference in the mode of connection. They are not prevented from grasping the same sense;

30 but they cannot have the same conception. *Si duo idem faciunt, non est idem.*

If two persons conceive the same, each still has his own conception.

[3] We can include with the conceptions the direct experiences in which sense-impressions and activities themselves take the place of the traces which they have left in the mind. The distinction is unimportant for our purpose, especially since memories of sense-impressions and activities always help to complete the conceptual image. One can also understand direct experience as including any object, in so far as it is sensibly perceptible or spatial.

[4] Hence it is inadvisable to use the word "conception" to designate something so basically different.

It is indeed sometimes possible to establish differences in the conceptions, or even in the sensations, of different men; but an exact comparison is not possible, because we cannot have both conceptions together in the same consciousness.

The referent of a proper name is the object itself which we designate by its means; the conception, which we thereby have, is wholly subjective; in between lies the sense, which is indeed no longer subjective like the conception, but is yet not the object itself. The following analogy will perhaps clarify these relationships. Somebody observes the moon through a telescope. I compare the moon itself to the referent; it is the object of the observation, mediated by the real image projected by the object glass in the interior of the telescope, and by the retinal image of the observer. The former I compare to the sense, the latter to the conception or experience. The optical image in the telescope is indeed one-sided and dependent upon the standpoint of observation; but it is still objective, inasmuch as it can be used by several observers. At any rate it could be arranged for several to use it simultaneously. But each one would have his own retinal image. On account of the diverse shapes of the observers' eyes, even a geometrical congruence could hardly be achieved, and a true coincidence would be out of the question. This analogy might be developed still further, by assuming A's retinal image made visible to B; or A might also see his own retinal image in a mirror. In this way we might perhaps show how a conception can itself be taken as an object, but as such is not for the observer what it directly is for the person having the conception. But to pursue this would take us too far afield.

We can now recognize three levels of difference between words, expressions, or whole sentences. The difference may concern at most the conceptions, or the sense but not the referent, or, finally,
31 the referent as well. With respect to the first level, it is to be noted that, on account of the uncertain connection of conceptions with words, a difference may hold for one person, which another does not find. The difference between a translation and the original text should properly not overstep the first level. To the possible differences here belong also the coloring and shading which poetic eloquence seeks to give to the sense. Such coloring and shading are not objective, and must be evoked by each hearer or reader according to the hints of the poet or the speaker. Without some affinity in human conceptions art would

certainly be impossible; but it can never be exactly determined how far the intentions of the poet are realized.

In what follows there will be no further discussion of conceptions and experiences; they have been mentioned here only to ensure that the conception aroused in the hearer by a word shall not be confused with its sense or its referent.

To make short and exact expressions possible, let the following phraseology be established:

A proper name (word, sign, sign combination, expression) *expresses* its sense, *refers to* or *designates* its referent. By means of a sign we express its sense and designate its referent.

Idealists or skeptics will perhaps long since have objected: "You talk, without further ado, of the moon as an object; but how do you know that the name 'the moon' has any referent? How do you know that anything whatsoever has a referent?" I reply that when we say "the moon," we do not intend to speak of our conception of the moon, nor are we satisfied with the sense alone, but we presuppose a referent. To assume that in the sentence "The moon is smaller than the earth" the conception of the moon is in question, would be flatly to misunderstand the sense. If this is what the speaker wanted, he would use the phrase "my conception of the moon." Now we can of course be mistaken in the presupposition, and such mistakes have indeed occurred. But the question whether the presupposition is perhaps always
32 mistaken need not be answered here; in order to justify mention of the referent of a sign it is enough, at first, to point out our intention in speaking or thinking. (We must then add the reservation: provided such a referent exists.)

So far we have considered the sense and referents only of such expressions, words, or signs as we have called proper names. We now inquire concerning the sense and referent of an entire declarative sentence. Such a sentence contains a thought.[5] Is this thought, now, to be regarded as its sense or its referent? Let us assume for the time being that the sentence has a referent! If we now replace one word of the sentence by another having the same referent, but a different sense, this can have no influence upon the referent of the sentence.

[5] By a thought I understand not the subjective performance of thinking but its objective content, which is capable of being the common property of several thinkers.

Yet we can see that in such a case the thought changes; since, e.g., the thought of the sentence "The morning star is a body illuminated by the sun" differs from that of the sentence "The evening star is a body illuminated by the sun." Anybody who did not know that the evening star is the morning star might hold the one thought to be true, the other false. The thought, accordingly, cannot be the referent of the sentence, but must rather be considered as the sense. What is the position now with regard to the referent? Have we a right even to inquire about it? Is it possible that a sentence as a whole has only a sense, but no referent? At any rate, one might expect that such sentences occur, just as there are parts of sentences having sense but no referent. And sentences which contain proper names without referents will be of this kind. The sentence "Odysseus was set ashore at Ithaca while sound asleep" obviously has a sense. But since it is doubtful whether the name "Odysseus," occurring therein, has a referent, it is also doubtful whether the whole sentence has one. Yet it is certain, nevertheless, that anyone who seriously took the sentence to be true or false would ascribe to the name "Odysseus" a referent, not merely a
33 sense; for it is the referent of the name which is held to be or not to be characterized by the predicate. Whoever does not consider the referent to exist, can neither apply nor withhold the predicate. But in that case it would be superfluous to advance to the referent of the name; one could be satisfied with the sense, if one wanted to go no further than the thought. If it were a question only of the sense of the sentence, the thought, it would be unnecessary to bother with the referent of a part of the sentence; only the sense, not the referent, of the part is relevant to the sense of the whole sentence. The thought remains the same whether "Odysseus" has a referent or not. The fact that we concern ourselves at all about the referent of a part of the sentence indicates that we generally recognize and expect a referent for the sentence itself. The thought loses value for us as soon as we recognize that the referent of one of its parts is missing. We are therefore justified in not being satisfied with the sense of a sentence, and in inquiring also as to its referent. But now why do we want every proper name to have not only a sense, but also a referent? Why is the thought not enough for us? Because, and to the extent that, we are concerned with its truth value. This is not always the case. In hearing an epic poem, for instance, apart from the euphony of the language we are

interested only in the sense of the sentences and the images and feelings thereby aroused. The question of truth would cause us to abandon aesthetic delight for an attitude of scientific investigation. Hence it is a matter of indifference to us whether the name "Odysseus," for instance, has a referent, so long as we accept the poem as a work of art.[6] It is the striving for truth that drives us always to advance from the sense to the referent.

We have seen that the referent of a sentence may always be sought, whenever the referents of its components are involved; and that this is the case when and only when we are inquiring after the truth value.

34 We are therefore driven into accepting the *truth value* of a sentence as its referent. By the truth value of a sentence I understand the circumstance that it is true or false. There are no further truth values. For brevity I call the one the true, the other the false. Every declarative sentence concerned with the referents of its words is therefore to be regarded as a proper name, and its referent, if it exists, is either the true or the false. These two objects are recognized, if only implicitly, by everybody who judges something to be true—and so even by a skeptic. The designation of the truth values as objects may appear to be an arbitrary fancy or perhaps a mere play upon words, from which no profound consequences could be drawn. What I mean by an object can be more exactly discussed only in connection with concept and relation. I will reserve this for another article.[C] But so much should already be clear, that in every judgment,[7] no matter how trivial, the step from the level of thoughts to the level of referents (the objective) has already been taken.

One might be tempted to regard the relation of the thought to the true not as that of the sense to the referent, but rather as that of subject to predicate. One can, indeed, say: "The thought, that 5 is a prime number, is true." But closer examination shows that nothing more has been said than in the simple sentence "5 is a prime number." The truth claim arises in each case from the form of the declarative sentence,

[6] It would be desirable to have a special term for signs having only sense. If we name them, say, representations, the words of the actors on the stage would be representations; indeed the actor himself would be a representation.

[C] See his "Ueber Begriff und Gegenstand" in *Vierteljahrsschrift für wissenschaftliche Philosophie* (XVI [1892], 192–205).

[7] A judgment, for me, is not the mere comprehension of a thought, but the recognition of its truth.

and when the latter lacks its usual force, e.g., in the mouth of an actor upon the stage, even the sentence "The thought that 5 is a prime number is true" contains only a thought, and indeed the same thought as the simple "5 is a prime number." It follows that the relation of the thought to the true may not be compared with that of subject to predi-
35 cate. Subject and predicate (understood in the logical sense) are indeed elements of thought; they stand on the same level for knowledge. By combining subject and predicate, one reaches only a thought, never passes from a sense to its referent, never from a thought to its truth value. One moves at the same level but never advances from one level to the next. A truth value cannot be a part of a thought, any more than say the sun can, for it is not a sense but an object.

If our supposition that the referent of a sentence is its truth value is correct, the latter must remain unchanged when a part of the sentence is replaced by an expression having the same referent. And this is in fact the case. Leibniz explains: "*Eadem sunt, quae sibi mutuo substitui possunt, salva veritate.*" What else but the truth value could be found, that belongs quite generally to every sentence concerned with the referents of its components and remains unchanged by substitutions of the kind in question?

If now the truth value of a sentence is its referent, then on the one hand all true sentences have the same referent and so, on the other hand, do all false sentences. From this we see that in the referent of the sentence all that is specific is obliterated. We can never be concerned only with the referent of a sentence; but again the mere thought alone yields no knowledge, but only the thought together with its referent, i.e., its truth value. Judgments can be regarded as advances from a thought to a truth value. Naturally this cannot be a definition. Judgment is something quite peculiar and incomparable. One might also say that judgments are distinctions of parts within truth values. Such distinction occurs by a return to the thought. To every sense belonging to a truth value there would correspond its own manner of analysis. However, I have here used the word "part" in a special sense. I have in fact transferred the relation between the parts and the whole of the sentence to its referent, by calling the referent of
36 a word part of the referent of the sentence, if the word itself is a part of the sentence. This way of speaking can certainly be attacked, because in the case of a referent the whole and one part do not suffice to deter-

mine the remainder, and because the word part is already used in another sense of bodies. A special term would need to be invented.

The supposition that the truth value of a sentence is its referent shall now be put to further test. We have found that the truth value of a sentence remains unchanged when an expression is replaced by another having the same referent: But we have not yet considered the case in which the expression to be replaced is itself a sentence. Now if our view is correct, the truth value of a sentence containing another as part must remain unchanged when the part is replaced by another sentence having the same truth value. Exceptions are to be expected when the whole sentence or its part is direct or indirect quotation; for in such cases, as we have seen, the words do not have their customary referents. In direct quotation, a sentence designates another sentence, and in indirect quotation a thought.

We are thus led to consider subordinate sentences or clauses. These occur as parts of a sentence structure, which is, from the logical standpoint, likewise a sentence. But here we meet the question whether it is also true of the subordinate sentence that its referent is a truth value. Of indirect quotation we already know the opposite. Grammarians view subordinate clauses as representatives of parts of sentences and divide them accordingly into noun clauses, adjective clauses, adverbial clauses. This might generate the supposition that the referent of a subordinate clause was not a truth value but rather of the same kind as the referent of a noun or adjective or adverb—in short, of a part of a sentence, whose sense was not a thought but only a part of a thought. Only a more thorough investigation can clarify the issue. In so doing, we shall not follow the grammatical categories strictly, but rather group together what is logically of the same kind. Let us first search for cases in which the sense of the subordinate clause, as we have just supposed, is not an independent thought.

37 The case of an abstract[D] noun clause, introduced by "that," includes the case of indirect quotation, in which we have seen the words to have their indirect referents coinciding with what is customarily their sense. In this case, then, the subordinate clause has for its referent a thought, not a truth value; as sense not a thought, but the sense of the words "the thought, that . . .," which is only a part of the thought

[D] A literal translation of Frege's "abstracten Nennsätzen" whose meaning eludes me.

of the entire complex sentence. This happens after "say," "hear," "be of the opinion," "be convinced," "conclude," and similar words.[8] Otherwise, and indeed somewhat complicated, is the situation after words like "perceive," "know," "fancy," which are to be considered later.

That in the cases of the first kind the referent of the subordinate clause is in fact the thought can also be recognized by seeing that it is indifferent to the truth of the whole whether the subordinate clause is true or false. Let us compare, for instance, the two sentences "Copernicus believed that the planetary orbits are circles" and "Copernicus believed that the apparent motion of the sun is produced by the real motion of the earth." One subordinate clause can be substituted for the other without harm to the truth. The main clause and the subordinate clause together have as their sense only a single thought, and the truth of the whole includes neither the truth nor the untruth of the subordinate clause. In such cases it is not permissible to replace one expression in the subordinate clause by another having the same customary referent, but only by one having the same indirect referent, i.e., the same customary sense. If somebody were to conclude: The referent of a sentence is not its truth value, "For then it could always be replaced by another sentence of the same truth value," he would prove too much; one might just as well claim that the referent of "morning star" is not Venus, since one may not always say "Venus" in place of "morning star." One has the right to conclude only that the referent of a sentence is *not always* its truth value, and that "morn-
38 ing star" does not always refer to the planet Venus, namely when the word has its indirect referent. An exception of such a kind occurs in the subordinate clause just considered whose referents are thoughts.

If one says "It seems that..." one means "It seems to me that..." or "I think that..." We therefore have the same case again. The situation is similar in the case of expressions such as "to be pleased," "to regret," "to approve," "to blame," "to hope," "to fear." If, toward the end of the battle of Waterloo,[E] Wellington was glad that the Prussians were coming, the basis for his joy was a conviction. Had he been

[8] In "A lied in saying he had seen B," the subordinate clause designates a thought which is said (1) to have been asserted by A (2) while A was convinced of its falsity.

[E] Frege uses the Prussian name for the battle—"Belle Alliance."

deceived, he would have been no less pleased so long as his illusion lasted; and before he became so convinced he could not have been pleased that the Prussians were coming—even though in fact they might have been already approaching.

Just as a conviction or a belief is the ground of a feeling, it can, as in inference, also be the ground of a conviction. In the sentence: "Columbus inferred from the roundness of the earth that he could reach India by traveling towards the west," we have as referents of the parts two thoughts, that the earth is round, and that Columbus by traveling to the west could reach India. All that is relevant here is that Columbus was convinced of both, and that the one conviction was a ground for the other. Whether the earth is really round, and whether Columbus could really reach India by traveling to the west are immaterial to the truth of our sentence; but it is not immaterial whether we replace "the earth" by "the planet which is accompanied by a moon whose diameter is greater than the fourth part of its own." Here also we have the indirect referents of the words.

Adverbial clauses of purpose beginning with "in order to" also belong here; for obviously the purpose is a thought; therefore: indirect referents for the words, subjunctive mood.

A subordinate clause with "that" after "command," "ask," "forbid," would appear in direct speech as an imperative. Such a clause has no referent but only a sense. A command, a request, are indeed not thoughts, yet they stand on the same level as thoughts. Hence in sub-
39 ordinate clauses depending upon "command," "ask," etc., words have their indirect referents. The referent of such a clause is therefore not a truth value but a command, a request, and so forth.

The case is similar for the dependent question in phrases such as "doubt whether," "not to know what." It is easy to see that here also the words are to be taken to have their indirect referents. Dependent clauses expressing questions and beginning with "who," "what," "where," "when," "how," "by what means," etc., seem at times to approximate very closely to adverbial clauses in which words have their customary referents. These cases are distinguished linguistically by the mood of the verb. In the case of the subjunctive, we have a dependent question and indirect reference of the words, so that a proper name cannot in general be replaced by another name of the same object.

In the cases so far considered the words of the subordinate clauses

had their indirect referents, and this made it clear that the referent of the subordinate clause itself was indirect, i.e., not a truth value but a thought, a command, a request, a question. The subordinate clause could be regarded as a noun, indeed one could say: as a proper name of that thought, that command, etc., which it represented in the context of the sentence structure.

We now come to other subordinate clauses, in which the words do have their customary referents without however a thought occurring as sense and a truth value as referent. How this is possible is best made clear by examples.

He who discovered the elliptic form of the planetary orbits died in misery.

If the sense of the subordinate clause were here a thought, it would have to be possible to express it also in a separate sentence. But this does not work, because the grammatical subject "he" has no independent sense and only mediates the relations with the consequent clause "died in misery." For this reason the sense of the subordinate clause is not a complete thought, and its referent is Kepler, not a truth value. One might object that the sense of the whole does contain a thought as part, namely, that there was somebody who first discovered the elliptic form of the planetary orbits; for whoever takes
40 the whole to be true cannot deny this part. This is undoubtedly so but only because otherwise the subordinate clause "he who discovered the elliptic form of the planetary orbits" would have no referent. If anything is asserted there is always an obvious presupposition that the simple or compound proper names used have referents. If one therefore asserts "Kepler died in misery," there is a presupposition that the name "Kepler" designates something; but it does not follow that the sense of the sentence "Kepler died in misery" contains the thought that the name "Kepler" designates something. If this were the case the negation would have to run not

Kepler did not die in misery

but

Kepler did not die in misery, or the name "Kepler" has no referent.

That the name "Kepler" designates something is just as much a presupposition for the assertion

Kepler died in misery

as for the contrary assertion. Now languages have the fault of containing expressions which fail to designate an object (although their grammatical form seems to qualify them for that purpose) because the truth of some sentences is a prerequisite. Thus it depends on the truth of the sentence:

There was someone who discovered the elliptic form of the planetary orbits

whether the subordinate clause

He who discovered the elliptic form of the planetary orbits

really designates an object or only seems to do so while having in fact no referent. And thus it may appear as if our subordinate clause contains as a part of its sense the thought that there was somebody who discovered the elliptic form of the planetary orbits. If this were right the negation would run:

Either he who discovered the elliptic form of the planetary orbits did not die in misery or there was nobody who discovered the elliptic form of the planetary orbits. 42

41 This arises from an incompleteness of language, from which even the symbolic language of mathematical analysis is not altogether free; even there combinations of symbols can occur which appear to refer to something having (at any rate so far) no referent, e.g., divergent infinite series. This can be avoided, e.g., by means of the special stipulation that divergent infinite series shall refer to the number 0. A logically complete language *(Begriffsschrift)* should satisfy the conditions, that every expression grammatically well constructed as a proper name out of signs already introduced shall in fact designate an object, and that no new sign shall be introduced as a proper name without having a referent assured. The logic books contain warnings against logical mistakes arising from the ambiguity of expressions. I regard as no less pertinent a warning against apparent proper names having no referents. The history of mathematics supplies errors which have arisen in this way. This lends itself to demagogic abuse as easily as ambiguity—perhaps more easily. "The will of the people" can serve as an example; for it is easy to establish that there is at any rate no generally accepted referent for this expression. It is therefore by no means unimportant to eliminate the source of these mistakes, at least

in science, once and for all. Then such objections as the one discussed above would become impossible, because it could never depend upon the truth of a thought whether a proper name had a referent.

With the consideration of these noun clauses may be coupled that of types of adjective and adverbial clauses which are logically closely related to them.

Adjective clauses also serve to construct compound proper names even if, unlike noun clauses, they are not sufficient by themselves for this purpose. These adjective clauses are to be regarded as equivalent to adjectives. Instead of "the square root of 4 which is smaller than 0," one can also say "the negative square root of 4." We have here the case of a compound proper name constructed from the predicate expression with the help of the singular definite article. This is at any rate permissible if the predicate applies to one and only one single object.[9]

42 Predicate expressions can be so constructed that characteristics are given by adjective clauses as, in our example, by the clause "which is smaller than 0." It is evident that such an adjective clause cannot have a thought as sense or a truth value as referent, any more than the noun clause could. Its sense, which can also be expressed in many cases by a single adjective, is only a part of a thought. Here, as in the case of the noun clause, there is no independent subject and therefore no possibility of reproducing the sense of the subordinate clause in an independent sentence.

Places, instants, stretches of time, are, logically considered, objects; hence the linguistic designation of a definite place, a definite instant, or a stretch of time is to be regarded as a proper name. Now adverbial clauses of place and time can be used for the construction of such a proper name in a manner similar to that which we have seen in the case of noun and adjective clauses. In the same way, predicate expressions containing reference to places, etc., can be constructed. It is to be noted here also that the sense of these subordinate clauses cannot be reproduced in an independent sentence, since an essential

[9] In accordance with what was said above, an expression of the kind in question must actually always be assured of a referent, by means of a special stipulation, e.g., by the convention that 0 shall count as its referent, when the predicate applies to no object or to more than one.

component, namely the determination of place or time, is missing and is only indicated by a relative pronoun or a conjunction.[10]

43 In conditional clauses, also, there may usually be recognized to occur an indefinite indicator, having a similar correlate in the dependent clause. (We have already seen this occur in noun, adjective, and adverbial clauses.) Insofar as each indicator refers to the other, both 44 clauses together form a connected whole, which as a rule expresses only a single thought. In the sentence

> If a number is less than 1 and greater than 0, its square is less than 1 and greater than 0

the component in question is "a number" in the conditional clause and "its" in the dependent clause. It is by means of this very indefiniteness that the sense acquires the generality expected of a law. It is this which is responsible for the fact that the antecedent clause alone has no complete thought as its sense and in combination with the consequent clause expresses one and only one thought, whose parts are no longer thoughts. It is, in general, incorrect to say that in the hypothetical judgment two judgments are put in reciprocal relationship. If this or something similar is said, the word "judgment" is used in the same sense as I have connected with the word "thought," so that I would use the formulation: "A hypothetical thought establishes a reciprocal relationship between two thoughts." This could be true only if an indefinite indicator is absent;[11] but in such a case there would also be no generality.

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[10] In the case of these sentences, various interpretations are easily possible. The sense of the sentence, "After Schleswig-Holstein was separated from Denmark, Prussia and Austria quarreled" can also be rendered in the form "After the separation of Schleswig-Holstein from Denmark, Prussia and Austria quarreled." In this version, it is surely sufficiently clear that the sense is not to be taken as having as a part the thought that Schleswig-Holstein was once separated from Denmark, but that this is the necessary presupposition in order for the expression "after the separation of Schleswig-Holstein from Denmark" to have any referent at all. To be sure, our sentence can also be interpreted as saying that Schleswig-Holstein was once separated from Denmark. We then have a case which is to be considered later. In order to understand the difference more clearly, let us project ourselves into the mind of a Chinese who, having little knowledge of European history, believes it to be false that Schleswig-Holstein was ever separated from Denmark. He will take our sentence, in the first version, to be neither true nor false but will deny it to have any referent, on the ground of absence of referent for its subordinate clause. This clause would only apparently determine a time. If he interpreted our sentence in the second way, however, he

If an instant of time is to be indefinitely indicated in both conditional and dependent clauses, this is often achieved merely by using the present tense of the verb, which in such a case however does not indicate the temporal present. This grammatical form is then the indefinite indicator in the main and subordinate clauses. An example of
44 this is: "When the sun is in the tropic of cancer, the longest day in the northern hemisphere occurs." Here, also, it is impossible to express the sense of the subordinate clause in a full sentence, because this sense is not a complete thought. If we say: "The sun is in the tropic of cancer," this would refer to our present time and thereby change the sense. Just as little is the sense of the main clause a thought; only the whole, composed of main and subordinate clauses, is such. It may be added that several common components in the antecedent and consequent clauses may be indefinitely indicated.

It is clear that noun clauses with "who" or "what" and adverbial clauses with "where," "when," "wherever," "whenever" are often to be interpreted as having the sense of conditional clauses, e.g., "who touches pitch, defiles himself."

Adjective clauses can also take the place of conditional clauses. Thus the sense of the sentence previously used can be given in the form "The square of a number which is less than 1 and greater than 0 is less than 1 and greater than 0."

The situation is quite different if the common component of the two clauses is designated by a proper name. In the sentence:

Napoleon, who recognized the danger to his right flank, himself led his guards against the enemy position

two thoughts are expressed:

1. Napoleon recognized the danger to his right flank
2. Napoleon himself led his guards against the enemy position.

When and where this happened is to be fixed only by the context, but is nevertheless to be taken as definitely determined thereby. If the entire sentence is uttered as an assertion, we thereby simultaneously assert both component sentences. If one of the parts is false, the whole

would find a thought expressed in it, which he would take to be false, beside a part which would be without reference for him.

[11] At times an explicit linguistic indication is missing and must be read off from the entire context.

is false. Here we have the case that the subordinate clause by itself has a complete thought as sense (if we complete it by indication of place and time). The referent of the subordinate clause is accordingly a truth value. We can therefore expect that it may be replaced, without harm to the truth value of the whole, by a sentence having the same truth value. This is indeed the case; but it is to be noticed that for purely grammatical reasons, its subject must be "Napoleon," for only then can it be brought into the form of an adjective clause belonging to "Napoleon." But if the demand that it be expressed in this form be waived, and the connection be shown by "and," this restriction disappears.

Subsidiary clauses beginning with "although" also express complete thoughts. This conjunction actually has no sense and does not change the sense of the clause but only illuminates it in a peculiar fashion.[12] We could indeed replace the conditional clause without harm to the truth of the whole by another of the same truth value; but the light in which the clause is placed by the conjunction might then easily appear unsuitable, as if a song with a sad subject were to be sung in a lively fashion.

In the last cases the truth of the whole included the truth of the component clauses. The case is different if a conditional clause expresses a complete thought by containing, in place of an indefinite indicator, a proper name or something which is to be regarded as equivalent. In the sentence

If the sun has already risen, the sky is very cloudy

the time is the present, that is to say, definite. And the place is also to be thought of as definite. Here it can be said that a relation between the truth values of conditional and dependent clauses has been asserted, namely such that the case does not occur in which the antecedent clause refers to the true and the consequent to the false. Accordingly, our sentence is true when the sun has not yet risen, whether the sky is very cloudy or not, and also when the sun has risen and the sky is very cloudy. Since only truth values are here in question, each component clause can be replaced by another of the same truth value without changing the truth value of the whole. To be sure, the light in which the subject then appears would usually be unsuitable; the

[12] Similarly in the case of "but," "yet."

46 thought would easily seem distorted; but this has nothing to do with its truth value. One must always take care not to clash with the subsidiary thoughts, which are however not explicitly expressed and therefore should not be reckoned in the sense. Hence, also, no account need be taken of their truth values.[13]

The simple cases have now been discussed. Let us review what we have learned!

The subordinate clause usually has for its sense not a thought, but only a part of one, and consequently no truth value as referent. The reason for this is either that the words in the subordinate clause have indirect reference, so that the referent, not the sense, of the subordinate clause is a thought; or else that, on account of the presence of an indefinite indicator, the subordinate clause is incomplete and expresses a thought only when combined with the main clause. It may happen, however, that the sense of the subsidiary clause is a complete thought, in which case it can be replaced by another of the same truth value without harm to the truth of the whole—provided there are no grammatical obstacles.

An examination of all the subordinate clauses which one may encounter will soon provide some which do not fit well into these categories. The reason, so far as I can see, is that these subordinate clauses have no such simple sense. Almost always, it seems, we connect with the main thoughts expressed by us subsidiary thoughts which, although not expressed, are associated with our words, in accordance with psychological laws, by the hearer. And since the subsidiary thought appears to be connected with our words of its own accord, almost like the main thought itself, we want it also to be expressed. The sense of the sentence is thereby enriched, and it may well happen that we have more simple thoughts than clauses. In many cases the sentence must be understood in this way, in others it may be doubtful whether the subsidiary thought belongs to the sense of the sentence or only ac-
47 companies it.[14] One might perhaps find that the sentence

Napoleon, who recognized the danger to his right flank, himself led his guards against the enemy position

[13] The thought of our sentence might also be expressed thus: "Either the sun has not risen yet or the sky is very cloudy"—which shows how this kind of sentence connection is to be understood.

[14] This may be important for the question whether an assertion is a lie, or an oath a perjury.

expresses not only the two thoughts shown above, but also the thought that the knowledge of the danger was the reason why he led the guards against the enemy position. One may in fact doubt whether this thought is merely lightly suggested or really expressed. Let the question be considered whether our sentence be false if Napoleon's decision had already been made before he recognized the danger. If our sentence could be true in spite of this, the subsidiary thought should not be understood as part of the sense. One would probably decide in favor of this. The alternative would make for a quite complicated situation: We would have more simple thoughts than clauses. If the sentence

Napoleon recognized the danger to his right flank

were now to be replaced by another having the same truth value, e.g.,

Napoleon was already more than 45 years old

not only would our first thought be changed, but also our third one. Hence the truth value of the latter might change—namely, if his age was not the reason for the decision to lead the guards against the enemy. This shows why clauses of equal truth value cannot always be substituted for one another in such cases. The clause expresses more through its connection with another than it does in isolation.

Let us now consider cases where this regularly happens. In the sentence:

Bebel mistakenly supposes that the return of Alsace-Lorraine would appease France's desire for revenge 49

two thoughts are expressed, which are not however shown by means of antecedent and consequent clauses, viz.:

(1) Bebel believes that the return of Alsace-Lorraine would appease France's desire for revenge

48 (2) the return of Alsace-Lorraine would not appease France's desire for revenge.

In the expression of the first thought, the words of the subordinate clause have their indirect referents, while the same words have their customary referents in the expression of the second thought. This shows that the subordinate clause in our original complex sentence is to be taken twice over, with different referents, of which one is a

thought, the other a truth value. Since the truth value is not the whole referent of the subordinate clause, we cannot simply replace the latter by another of equal truth value. Similar considerations apply to expressions such as "know," "discover," "it is known that."

By means of a subordinate clause of reason and the associated main clause we express several thoughts, which however do not correspond separately to the original clauses. In the sentence:

"Because ice is less dense than water, it floats on water" we have

(1) Ice is less dense than water;
(2) If anything is less dense than water, it floats on water;
(3) Ice floats on water.

The third thought, however, need not be explicitly introduced, since it is contained in the remaining two. On the other hand, neither the first and third nor the second and third combined would furnish the sense of our sentence. It can now be seen that our subordinate clause

because ice is less dense than water

expresses our first thought, as well as a part of our second. This is how it comes to pass that our subsidiary clause cannot be simply replaced by another of equal truth value; for this would alter our second thought and thereby easily alter its truth value.

The situation is similar in the sentence

If iron were less dense than water, it would float on water.

49 Here we have the two thoughts that iron is not less dense than water, and that something floats on water if it is less dense than water. The subsidiary clause again expresses one thought and a part of the other.

If we interpret the sentence already considered

After Schleswig-Holstein was separated from Denmark, Prussia and Austria quarreled

in such a way that it expresses the thought that Schleswig-Holstein was once separated from Denmark, we have first this thought, and secondly the thought that at a time, more closely determined by the subordinate clause, Prussia and Austria quarreled. Here also the subordinate clause expresses not only one thought but also a part of another. Therefore it may not in general be replaced by another of the same truth value.

It is hard to exhaust all the possibilities given by language; but I hope to have brought to light at least the essential reasons why a subordinate clause may not always be replaced by another of equal truth value without harm to the truth of the whole sentence structure. These reasons arise:

(1) when the subordinate clause does not refer to a truth value, inasmuch as it expresses only a part of a thought;

(2) when the subordinate clause does refer to a truth value but is not restricted to so doing, inasmuch as its sense includes one thought and part of another.

The first case arises:

(a) in indirect reference of words

(b) if a part of the sentence is only an indefinite indicator instead of a proper name.

In the second case, the subsidiary clause may have to be taken twice over, viz., once in its customary reference, and the other time in indirect reference; or the sense of a part of the subordinate clause may likewise be a component of another thought, which, taken together with the thought directly expressed by the subordinate clause, makes up the sense of the whole sentence.

It follows with sufficient probability from the foregoing that the cases where a subordinate clause is not replaceable by another of the
50 same value cannot be brought in disproof of our view that a truth value is the referent of a sentence having a thought as its sense.

Let us return to our starting point!

If we found "$a=a$" and "$a=b$" to have different cognitive values, the explanation is that for the purpose of knowledge, the sense of the sentence, viz., the thought expressed by it, is no less relevant than its referent, i.e., its truth value. If now $a=b$, then indeed the referent of "b" is the same as that of "a," and hence the truth value of "$a=b$" is the same as that of "$a=a$." In spite of this, the sense of "b" may differ from that of "a," and thereby the sense expressed in "$a=b$" differs from that of "a=a." In that case the two sentences do not have the same cognitive value. If we understand by "judgment" the advance from the thought to its truth value, as in the above paper, we can also say that the judgments are different.

DONALD WILLIAMS' THEORY OF INDUCTION[1]

I

CONSIDER a population of 9 balls, 6 of them white and 3 black. If these 9 balls are distinguished by the different names "w_1," "w_2"...."w_6," and "b_1," "b_2," and "b_3," one may easily see, by tracing out the different combinations in turn, that there are 84 different possible ways of combining the balls in sets of 3. Of these 84 different possible combinations, 45, which is a majority, have the same composition as the whole population; that is, the ratio of black to the white balls in each of them is likewise 1:2. This illustrates, in connection with a relatively small population and a small sample, a fundamental principle in the logic of combinations which leads to the following universal conclusion when the samples are large, namely, that the vast majority of the possible combinations must have *approximately* the same composition as the population. In this logically demonstrable proposition, itself the consequence of the well-known Bernoulli Theorem in the mathematics of probability, Williams contends that there is a quite sufficient ground for validating the practice of inductive inference generally. For from it follows, he holds, that

> given a fair-sized sample...from any population, with no further material information, we know logically that it very probably is one of those which match the population, and hence that very probably the population has a composition similar to that which we discern in the sample. This is the logical justification of induction (p. 97).

In the words of the above quotation, we know these things "logically." That is to say, from the premise that a certain sample drawn from any population is a fair-sized or large one, it follows, purely

[1] The following is a critical examination of the theory of inductive validity presented in Williams' *The Ground of Induction* (Cambridge: Harvard University Press, 1947).

analytically, by means of the principles of logic and mathematics alone and with no employment of any empirical principles or premises, that very probably the population has a composition similar to that which can be discerned in the sample. Given a sample of 1,000 university students, none of whom are studying hotel management, and no further empirical information, it is overwhelmingly probable that none or very few university students study hotel management. Or given a different ratio in the sample, say that 10 per cent are students of hotel management, it follows analytically, though not certainly but very probably, that approximately 10 per cent of all university students likewise study hotel management. The statements that these two inductive conclusions have each a high probability in relation to their respective premises are analytic, logically certifiable statements, according to this view, and it is held to be indispensable for the justification of induction that some such statements, describing the probability of inductive conclusions on the basis of the testable properties of the sample, be so. For if one supposes that no such statements are certifiable by purely logical means but are instead estimates of empirical frequencies, then every statement ascribing a probability to an inductive conclusion is itself an inductive conclusion. The employment of any such probability statements as grounds for induction would then, according to this view, presuppose the validity of inductive method and, as a basis for establishing that validity would, as Williams holds in agreement with various other philosophers, be logically circular and fallacious.

But what kind of probability is this, which can be established on such grounds, and which, in its application to inductive estimation, appears in the demonstrable principle that if M is the population and MQ is a large sample drawn from the population, then in relation to this given information the probability is high that the composition of M is approximately the same as that of MQ? That it is not a probability interpreted in terms of relative frequency of the occurrence of a certain type of event in the long run in a given reference class of events, or the limit of such a frequency, is indicated in the requirement just observed that statements affirming such probability must be establishable, at least in some cases, if circularity in the ground of induction itself is to be avoided, without dependence upon any inductive conclusion. In his recently published criticisms of the frequency theory of probability, Williams has presented in detail the reasons for his rejection of this

theory in favor of the classic or Laplacean theory.[2] In the present work, while reaffirming his general adverse view of the frequency theory, he has concentrated his efforts upon presenting and defending his own positive account of probability and elucidating its application in answering various questions about the validity of inductive knowledge.

What "probability" means, on his view, instead of relative frequency in the long run, or any similar thing, is something which can be defined, perhaps not for every possible case of the application of the term, but sufficiently widely to afford a justification of induction, by what he calls "the proportional syllogism." The definition of probability in these terms is simplified if one considers it only in connection with finite collections, a procedure held by Williams not to be necessary, but to be justified not only by the simplicity it affords, but also by the fact that "we never or almost never deal, in science or common sense, with classes which are literally infinite" (p. 43), and, though it is extremely likely that "no classes of concrete objects or events are infinite," even if some were, one would always be able to satisfy any real curiosity he may have without dealing with them (pp. 157–158). In the ordinary syllogistic forms the statements "All M is P" and "a is M" entail "a is P," while the statements "No M is P" and "a is M" together contradict "a is P," and their combined truth thus renders its truth impossible. In its application to finite collections the proportional syllogism takes care of the intermediate cases between the one in which all the M's are P and the one in which none are. For these cases it provides probability relations which are alleged to be relations of logical credibility, essentially similar in their necessity and objectivity to the two relations of entailment and contradiction, but intermediate between these two extremes in the degree of credibility which they provide. The basic principle of the proportional syllogism defining these relations can be formulated thus: If $\frac{m}{n}$ M is P, and a is M, then there is a probability of $\frac{m}{n}$ that a is P. This means that if it is known that 75 per cent of college professors use tobacco, in the absence of any further relevant information there is a probability or credibility

[2] *Philosophy and Phenomenological Research*, V, no. 4; VI, nos. 1, 4 (1945–1946).

of .75 that Professor Jones uses tobacco. And it implies that the statements that there are six horses in the field, that Mercury is one of these, and that just one horse will win, taken together and by themselves, confer upon the statement that Mercury will win a probability of $\frac{1}{6}$. Both these examples illustrate, though the latter more obviously, the rule of Laplace that the probability is equal to the ratio of the number of favorable cases to the number of all possible cases.

Students of these matters have long been aware of the paradoxes and other untenable conclusions which can be got by the incautious employment of this rule, but Williams, with no apparent misgivings, proceeds to apply it directly in the derivation of a probability for inductive conclusions. The main thing now is to show that the ratio of the number of favorable cases to the number of all possible cases is in inductive inference a high one, and this Williams finds conveniently to be an analytic truth, demonstrable in pure mathematics in a variety of ways, such as in the laws of combinations, and much more easily in the case of large populations, in the formula for the standard error of proportions or sampling, $\sigma = \sqrt{\frac{pq}{n}}$. According to this formula, if p is the true ratio of M's that are P in a given population class M, and if q is the ratio of those which are not P, which is of course $1 - p$, and if n is the number of M's in the sample, then σ is the standard error of the proportions in the sense that it is the standard deviation of the frequency distribution of the different proportions, ranging between 1 and 0, among all the possible samples of this same size.[3] When the samples are sufficiently large, it can be shown that a little over two-thirds of the possible samples will diverge from the true ratio among the proportions by an amount no greater than the standard deviation; more than 95 per cent will deviate no more than twice the standard deviation; more than 99 per cent will deviate less than three times the standard deviation; and so on. And, as can be seen in the formula as the samples increase in size, the value of the standard deviation itself becomes decreasingly small.

[3] Cf. C. C. Peters and W. R. Van Voorhis, *Statistical Procedures and Their Mathematical Bases* (1940), pp. 143–45; G. U. Yule and M. G. Kendall, *An Introduction to the Theory of Statistics* (11th ed., 1937), pp. 350–357.

Inasmuch as the distribution of the possible samples can be depended upon to have the above characteristics only when the samples are large, the principles derived from them are termed "laws of large numbers"; and though their general effects may be illustrated, as in the case of the example with which this paper began, in certain select cases with small samples, they are universally true only for large ones. If, in the example of the population of nine balls, one counts each separate logically possible combination of three of the balls as a possible sample, then, since the proportion of the number of possible samples which exactly match the population in composition is $\frac{45}{84}$, there is a probability represented by this same fraction that any single one of these samples matches the population. Now matching is clearly a symmetrical relation, such that if sample S matches population P it follows analytically that population P matches sample S. Therefore, the probability of an inductive inference generalizing from the composition of any given sample of this population to the population as a whole is, in the absence of any further relevant information, exactly $\frac{45}{84}$, not overwhelming but clearly greater than $\frac{1}{2}$.

The next important step in the argument is the purely mathematical one of showing that the crucial ratio, which is comparatively modest in the above example, becomes extremely large when large samples are employed and, furthermore, that the ratio is large regardless of the actual composition of the parent population from which the sample is taken. For this purpose the means are already at hand in the formula for standard error of sampling. First it is necessary to relax the requirement that the sample exactly match the population, to the extent of permitting an approximate match between the two, that is, permitting that the proportion in the sample of the property whose incidence is being investigated coincide with the proportion in the parent population within some specified small margin of error. Then, as is clear, for example, in the formula for standard error of sampling, it is logically necessary that, with large enough samples, the overwhelming majority of logically possible samples of the same size approximately

match the population in composition, since the majority is overwhelming even in those cases in which the composition of the population with respect to the property in question is exactly $\frac{1}{2}$ and in which consequently the proportion of matching cases among the logically possible ones is at a minimum. When the principle of the proportional syllogism is now combined with this result, it follows, according to this argument, that, when once the permissible margin of error is specified in the match between sample and population, the minimum probability for any induction from a sample of a given size can be calculated by the formula of standard error; and it can be shown that, given samples of a certain size—and with a moderate margin of error they need be only moderately large—the minimum probability will be very high that any induction generalizing the approximate composition of a sample of this size will have a true conclusion.

II

The mathematics which Williams has employed in his argument is well established and clearly sound. What is not so clearly sound is the application which he has made of it to induction, and specifically his combination with it of the proportional syllogism and the conclusions derived from that combination. For it is the proportional syllogism which effects the transition from the fact that with sufficiently large samples the proportion of approximately matching combinations among all logically possible combinations of the same size is high, to the conclusion that the probability of an induction from any one of these samples is correspondingly high. The process of counting the number of favorable cases among the possible ones and determining the probability of the outcome upon this ratio, which is central here, has been the subject of much criticism in logic and probability theory in the past seventy-five years and, in contradiction to Williams' view of the matter, the main lines of this criticism appear to be sound. After all, the counting of cases can be effected in a variety of ways, and there is no reason to suppose that such a simple rule of counting will be a reliable instrument for predicting a certain outcome unless there is some evidence in particular cases that the things counted and the ratio derived therefrom represent something about, not just what logically

might be, but what is the course of events in nature. Why, for example, in assaying the probability of induction, should one count possibilities in the way Williams counts them, letting each logically possible combination count as 1? Why not, if counting possibilities is all that is necessary, do it in another and simpler way? The range of the composition of any finite population with respect to a given property P must fall somewhere between 0 and 1. If, therefore, one specifies that the sample must match the population in composition within the margin of .01, on this way of counting possibilities the probability of securing a matching sample will in no case be greater than $\frac{1}{50}$, and in some cases, when the composition of the population approaches 0 or 1, it will be very, very much less. Or why not, if it is objected that the above procedure does not lead to a direct count of the logically possible combinations, count instead the number of possible compositions, i.e., the combinations of different composition which are logically possible in samples of the specified size in the population. The substitution of this method for Williams' in the above case of the 9 balls would reduce the probability of an exact match from $\frac{45}{84}$ to $\frac{1}{4}$. In general the probability of a matching sample, on either of these ways of counting chances, and hence the probability of an induction based upon such a sample, judged as the probability of getting an approximately matching sample with such a population, will diverge widely from the probability derived according to Williams' way of making the count. And if one observes here that on either of these alternative ways of assaying the probabilities, certain strange and unsatisfactory results immediately ensue, the unsatisfactoriness of these results serves but to sharpen the criticism being made of this whole account of inductive probability.[4] For it is the principle of the proportional syllogism, the principle that the probability of events can be calculated by merely counting the favorable possibilities and calculating their ratio to the total number of possibilities that leads to these results, and if the results

[4] E.g., according to the former way of calculating the ratio the probability of an approximate match in a large population, where there is no question of the sample exhausting the population, is quite independent of the size of the sample; according to the latter in a similarly large population of M's containing only one MP the probability of an exactly matching sample, no matter what size, is ½.

are not credible, then indeed it is so much the worse for the principle. And if Williams' way of calculating the ratio leads, in many cases, to results that are not so radically divergent from what good sense and scientific practice themselves yield, the favorable difference in these cases is not, in the face of the above divergences, due to the a priori validity of the syllogism, but rather to the fact that there is indeed sometimes further material evidence that possibilities so counted and ratios so calculated can be taken seriously.

The fundamental difficulty in Williams' theory of induction is located here, in the inacceptability of the proportional syllogism, and more particularly, in its inacceptability as employed in calculating the minimum probability of a matching sample of a given size, and hence, according to the argument, the minimum probability of an inductive generalization from a sample of such size. This syllogism does not provide what Williams attempts to elicit from it, that is, a clearly defined relation of logical credibility, differing in degree from logical entailment, but similar in the essential respect that it is binding upon a person "who understands what truth is and wants to believe what is true" (p. 30). "Probability" is without doubt a word with a variety of usages; and Williams with others may be permitted to define it in whatever way he chooses. But his right to do this does not guarantee that the probability he defines will be uniquely determined in any given situation, or, if it is, that there will be any connection between the kind of probability which is so determined and what is effective, successful procedure in the inductive pursuit of truth.

It has been widely supposed among students of probability that, in order to calculate the probability of an approximate match in the way pursued by Williams, something further must be known about the way the items in the population are distributed or the way in which the samples are drawn. Either the items in the population are distributed in such a "random" or "irregular" way, or they are drawn in such a way, that the ratios calculable by the Binomial Theorem, the formula of standard error, or even more generally, the Bernoulli Theorem, may be taken as a long-run guide to the relative frequencies with which different kinds of samples may be expected. The mathematical definition of random series and the applications of these definitions to concrete classes of objects involve many complex and difficult problems, some of which are indicated in Williams' criticism of several versions

of the requirement that the sample be a random or fair one (pp. 66–76, 140–148). But the applications of these ideas in the sciences and in the conduct of practical affairs indicates that in some cases, at least, these ideas of random populations and samplings can be effectively defined and applied. Williams contends vigorously that any such support of the use of the ratios of the proportional syllogism as a measure of probability is not only unnecessary but also contradictory to the idea of probability as a relation of graded credibility, and he treats such requirements of randomness or fairness as due to the not unnatural but mistaken quest for certainty appearing in the demand that the "law of averages" must eventually be realized, that the estimated probabilities must inevitably mature. No doubt requirements of randomness, homogeneity, or proportionality have been mistakenly used in this way, just as the Bernoulli Theorem has sometimes been mistaken as providing a certainty that sufficiently large samples will match the composition of the population. But Williams' method of avoiding these fallacies, with its endorsement of the use of the proportional syllogism for measuring probability without any such suppositions, does so at the extreme expense of providing no evidence whatever that the ratios employed in the syllogism are at all relevant to the relative frequency with which samples of the kind in question would be drawn from the population. As a part of pure mathematics the proposition that 45 out of 84 logically possible combinations in the population of 9 balls have the desired character is valuable and incontestable. But unless there is some further evidence, as in the idea of random distributions, that those types of sample which have the higher ratio among the possible samples will be the more frequently realized, there is no reason to suppose that this ratio means that this type of sample can be expected with any more assurance than any other, or that men who predict this kind of sample in drawing from the populations will be more often correct than those with different predictions.

In its mathematical outlines, Williams' theory of inductive validity is substantially identical, as he observes, with one of the theories which Peirce devised to deal with this matter.[5] But Peirce's application of the same mathematics to the question of inductive validity is circumscribed and qualified in two ways in which Williams' applica-

[5] *Collected Papers*, 2.685–693, 2.698–703.

tion is not, with the result that although Peirce's theory does not provide an account of the validity of induction which is universally applicable to all forms of inductive inference, it does make a sounder calculation of probabilities than Williams' version, and the probability which it does estimate is clearly relevant to the validity or credibility of some types of inductive inference. Accepting an empirical interpretation of probability as referring to the relative frequency of the occurrence of a certain type of event in the long run in some reference class of events, Peirce rejected the view that probabilities could be profitably interpreted or calculated, as Williams has attempted to do, by calculating the number of favorable cases in relation to the total number of logically possible ones. In accordance with this basic decision on probability, he was led to circumscribe his calculation of the probability of inductive inferences by means of the formula of standard error by the restriction that the probability of securing an approximately matching sample calculated in this way requires that the samples be drawn in a random manner.[6]

The second important difference in Peirce's employment of these mathematical processes in establishing inductive validity is that he does not derive the conclusion that because the minimum probability of securing an approximately matching sample is a high number, say k, the minimum probability of an inductive conclusion generalizing the composition of any sample is likewise k. It is true that Pierce does assert, in a passage to which Williams calls attention, that the relation of approximate equality, which is employed in calculating by the formula of standard error the probability of securing a match in a "well-drawn" sample of a given size, is a convertible relation, and that because of this, when such a match can be shown to be probable an inductive conclusion generalizing the composition of any such sample is likewise probable.[7] But Pierce is concerned to point out in this same piece of writing and to repeat in others that when he speaks of the probability of an inductive conclusion and endeavors to establish a given conclusion as probable in the above manner, he is speaking of the "special form" or "precept of inference" which is followed in this particular case and is affirming something about the relative frequency with which, when such a form or precept is employed, true conclusions

[6] *Op. cit.*, 2.702, 2.726, etc.
[7] *Op. cit.*, 2.718–720.

will follow.[8] His method, he says, does not propose, even if it were feasible, "to look through all the possible universes, and say in what proportion of them a certain uniformity occurs"; it tries rather to judge the trustworthiness of the procedure followed by estimating "how frequently, in this universe, the special form of induction or hypothesis would lead us right."[9] In accordance with this conception of inductive validity, as he makes particularly clear on another occasion,

> it is by no means certain that *the conclusion actually drawn in any given case* would turn out true in the majority of cases where precisely such a method was followed; but what is certain is that, in the majority of cases, the method would lead to some conclusion which was true, and that in the individual case in hand, if there is any error in the conclusion, that error will get corrected by simply persisting in the employment of the same method.[10]

One may disregard here the question whether the results described above are literally certain, as Peirce says, or only increasingly probable as the size of the sample increases, in order to concentrate briefly upon the difference between the conclusion which Peirce derives concerning the probability of induction and that derived by Williams. For the difference is important in assaying the internal cogency of Williams' argument in defense of inductive method. Although it can be shown that there is a high minimum probability, k, in either Peirce's or Williams' sense of probability, that a sample of a certain size will approximately match the population M in the ratio of M's that are also P, it does not follow from this that, given a sample a of that size there is a similar probability that the population matches *this* sample. This is what Peirce has been saying in the passages quoted above, and it is a point which Williams has failed to recognize. Perhaps the easiest way to see that this is so is to notice that when one says that there is a probability k that a matches M, the reference class in the probability statement is the class of possible combinations in M of the same size as a, but that when one speaks of the probability that M matches a the reference class is changed. Unless one is prepared to engage in calculating the relative number of all possible universes which would have classes of M's in them approximately matching this particular a, or in some other way estimating the number of logically possible M's which would have the desired characteristic, he is forced to choose with

[8] *Op. cit.*, 2.703.
[9] *Op. cit.*, 2.748. Cf. also 2.893.
[10] *Op. cit.*, 2.781. Italics mine.

Peirce some reference class like the class of applications of this particular inductive method. But whether one accepts Peirce's idea of a proper reference class for such a statement or not, the main point which Williams has neglected remains the same, and that is that the reference classes in the two probability statements are different. Because of this one cannot conclude, as Williams does, that because the probability on the evidence e that a matches M is k, and because matching is a symmetrical relation, the probability on e that M matches a is likewise k.

What Williams' argument requires at this point is some rule, like the rule that logically equivalent statements have the same probability on the same evidence, which would enable him to make the kind of transformation involved in the transition from the former to the latter of the above statements. But that rule, while it would save the logical cogency of his argument at this one point, would do so at the expense of equally or more serious difficulties at other points. For it seems very clear that, useful as the rule may be at this particular juncture, it is, so long as probability is interpreted as it usually is, and as Williams does interpret it, in terms of reference classes, one of extreme doubtfulness. When probability is defined empirically in terms of the relative frequency of certain types of occurrence, it is not difficult to find cases which falsify the principle. When probability is interpreted in Williams' terms as the ratio of favorable among possible cases, the rule presupposes that two classes of cases defined in relatively different ways will have the same ratio of favorable cases, when these latter cases are defined in very similar though not identical ways. That the rules of counting possible cases and calculating the ratio of the number of favorable ones, lax as they notoriously are, should guarantee the identity of such a ratio seems highly doubtful, and if they do not, then the difficulty presented here, interpreted internally to Williams' system, is that the rule of transformation is not logically compatible with the main principle of the system, which is the principle of the proportional syllogism.[11] Nevertheless some principle of this kind is required in the final step in Williams' argument when he

[11] The need for a principle here that the probability of equivalent propositions is the same and the question of the compatibility of such a principle with Williams' principle of the proportional syllogism were called to my attention by Max Black of Cornell University.

passes from a statement about the probability of having a sample of a certain sort to one of having a population of that sort, in order to make the argument, regardless of the factual interpretation and truth of its premises, logically valid. And even though it were possible, which likewise seems unlikely, to save the argument by the use of a principle so restricted as to exclude all contradictory cases, such a modification would, by limiting radically the range of application of the argument, destroy its claim to provide a proof for the validity of inductive method in general. Peirce's view of this matter, which takes the probability of securing a match in a sample of the size of a to be the probability that one will secure approximately true inductive conclusions in the continued application of this special method or precept of inference, and to be thus indicative of the reliability of trustworthiness of this precept or method, has avoided the above difficulty. But, as its author emphasizes, and it is worth repeating once more, it professes to warrant this conclusion only on the condition that the samples are drawn in accordance with a random method.

III

Two important defects have been exposed in Williams' theory by the preceding discussion. The first of these is that the attempted definition of probability by means of the proportional syllogism does not specify clearly and uniquely what it is intended to define, and, moreover, in those situations in which its application seems relatively unambiguous there is no reason, in its character as so defined, for supposing it to possess the credentials as a guide to belief which Williams attributes to it. The second is that if one should accept the definition and apply it to the sampling formula in the way the theory prescribes, it still would not follow that specific inductive conclusions would have the high probability which Williams' argument alleges. That, despite Williams' contentions, despite his defined relation being called by him "probability" and "a relation of logical credibility," and despite also some analogies drawn by him between this relation and entailment and contradiction, it does not have proper credentials as it stands as a guide to reasonable or reliable belief becomes increasingly clear in his more detailed account and examples of the applications of induction in science, in everyday life, and in philosophy. According to this view, for example, if a man examines a sample of 2,500 M's

and finds that 2,000 of these are also P, on this evidence alone there is a probability of at least .95 that the proportion of MP's in the total population of M's is no less than .78 and no more than .82. Now granting for purposes of argument what has just previously been questioned, namely, that Williams' argument does succeed in proving that probability of the kind he has defined does accrue to an inductive conclusion in this way through the formula of standard error of sampling, is that a good reason for believing the conclusion? More exactly, is there on such grounds any more reason for supposing that a conclusion drawn in this manner is true than there is for believing it to be false?

Williams points out that it is an observed fact that the subclasses people select as samples in actual practice do customarily match each other and the populations they represent in the way one should expect according to the law of large numbers expressed in the formula of standard error. Inductive probabilities calculated according to this formula have, as he says, "been in the habit of maturing" (p. 119). Whether this alleged fact about the uniformity of nature is indeed so, at least to the extent indicated here, may be argued. But it need not be, since, as Williams makes quite clear throughout the book, even granting this to be so, the basic claim of induction to validity cannot, upon his view, rest upon any such fact, for it is itself an inductively learned fact and the procedure for grounding induction upon it would consequently, as he conceives it, be logically circular and without force.

Suppose that a man, or perhaps better, a group of men, engage in making inductions and in apportioning the probability and consequently the assurance of their belief in them according to the method of calculation set forth in this theory. And suppose further that this group of men discover as they go along that they are not doing well, that the kind of inductions which are sanctioned as highly probable by their rules are usually not supported by further experience, and that correspondingly many of the inductions which are supported uniformly are ones whose probability according to the rules is slight. There are two main and related means in the theory which Williams has provided for meeting objections of this kind. The first of these is the affirmed relativity of all probability to the evidence upon which it is based; the second, which appears as a consequence of the first, the thesis that in no probability statement is there a guarantee that the probability

affirmed, no matter how high that is, will in actual fact mature. If, therefore, one finds that his highly probable inductions, e.g., his inductions with samples of size 2,500, are frequently or consistently unsupported by further experience, this too is a fact to be fed into the hopper of inductive method, as evidence now in a secondary induction about the successful use of a particular method of inquiry. The probability of any primary induction with samples of this size must now be compounded with the new probability, and the resultant figure, which may be radically different from the first, is the probability of the induction upon the fuller evidence. This, basically, is the reason why Williams is able to affirm probabilities which are unsupported by any evidence of empirically observed uniformities without fear that subsequent observations will contradict them. It cannot contradict them, no matter how high they are, for there is no guarantee in any of them that they will mature and their failure to mature is consequently no evidence against them, though it may, curiously, lead to the calculation of a new and radically different probability.

Because of the bearing upon the estimation of inductive probabilities of secondary and other higher inductions about the successful application of the particular methods involved, and because of the bearing of many other inductions whose results are normally relevant to the estimation of the incidence of a certain type of event in some reference class of events, the number of probabilities involved in the estimation of the probability of a specific induction on the available relevant evidence is going to be, in almost any case, enormous. And only a detailed analysis of Williams' proposals for compounding the various probabilities by means of such formulas as Bayes's Theorem will show convincingly whether the compounding proposed is practicable or whether, if it is, the results achieved are of a kind which correlates positively with what has been established as successful procedure in science and other areas of experience. But omitting the detailed analysis which such decisions would require, it is more important to be clear that, whether these things are so or not, the kind of probability which is dealt with, measured, and compounded by these methods is by definition not the kind which one needs for the validation of inductive inference nor the kind which the inductive skeptics have so troublesomely striven to show that one cannot possibly have. The kind of probability, the kind of estimation of likelihood which one wants and

needs, is the kind which is a good, trustworthy guide in the apportioning of assurance in the control of belief. It is the kind which, provided that its calculation is correct and the calculated probability of a conclusion is high, does constitute an assurance or guarantee that the method followed does as a matter of fact yield results which in this world are always or very often correct. Or, contrariwise, if it is found that the method is not in this sense a trustworthy guide to belief, then one knows that the statement that the conclusion was highly probable, though it may have seemed sound on the evidence upon which it was based, was as a matter of fact false.

In comparison with these needs the kind of probability dealt with by Williams and offered by him for the universal vindication of inductive procedures is inappropriate and unsatisfactory. And the provisions in the theory for explaining the predicament which occurs when those who, not realizing this inappropriateness, are led by the theory to judge as worthy of confidence types of conclusion which have a high mortality in the ordeals of further experience, can properly be compared with those for explaining the predicament of a man who in his search for Heaven was taught the wrong rules for distinguishing good from bad, and who eventually, because of his misjudgments, arrived at the exact place which he had so much wanted to avoid. And if, as the phrase goes, he should "lift up his eyes, being in torments" in that region, and beholding his teacher, who in justice should share his fate, should complain that he had been taught badly to judge between good and evil, he would be little solaced and his teacher little justified by the reply that of course judgments of good and bad are always relative to the evidence, and that though on the evidence previously employed their mortal judgments were and still are wise, on the further evidence now available in Hell they would have to be regarded as unwise. What had been wanted by the complainant in mortal life was a way of making decisions about good and evil which would be wise in the sense of paying-off or leading to the right destination, if not universally, at least in a greater proportion of cases than other methods which were then available to him. And if now this unfortunate man discovers that no such claim was or could be made for the method he followed, but that in some different sense, which his teacher in the unlimited time provided in that state proceeded to

explain, the method he followed could still be called "wise," he could only conclude that he had been misled.

This is but to say again and metaphorically that an adequate ground of induction must provide answers to questions about the reliability of specific inductive procedures, and also about the desirability and efficacy in the pursuit of truth of the more general attitudes and practices which have come to be associated with the reasonable or scientific investigation of matters of fact. If it is to offer the kind of support which men have in general looked for, and which the inductive skeptics have attempted to prove they can never find, for a given inductive procedure or attitude, it must produce something which in a broad way can be described as a "reason" for believing that when this method or attitude is applied to the kind of subject matter in question, true conclusions are derived more often than by the other methods of controlling belief that are its present effective alternatives. These things Williams' theory does not and, because of the peculiar character of the probability which it defines and employs, cannot provide. The kind of probability which the central theory seeks to confer upon inductive conclusions, despite the impressive nomenclature of "logical credibility" and similar terms with which it is presented, is, beneath these linguistic wrappings, an illusory kind. And the victory which it is professed to ensure over the inductive skeptics and other more or less vested dissidents from modern scientific inductive procedure is consequently merely verbal and an empty one.

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THE PRAGMATIC THEORY OF SCIENTIFIC OBJECTS

1. *The claim of pragmatism.* That no philosophical theory developed before the rise of modern science offers an account of knowledge consonant with the actual procedures of modern science, and that pragmatism has remedied this deficiency, are claims with which contemporary philosophers have been made familiar. And so long as pragmatism continues to clarify and develop the significance of these claims, their merits cannot be considered to have been as yet finally assessed. Toward this assessment the present article is offered as a contribution. Its concern is principally with the doctrine which constitutes the heart of the pragmatic theory of knowledge, namely, the instrumentalist conception of the objects of science, taken as models for understanding the nature of any objects of knowledge.

For pragmatism, theories of knowledge fall into one of two main classes, depending upon their estimate of the role of "directed activity," the "procedures of inquiry," with respect to the object which can be said to have the property of being known. Older, pre-experimental theories of knowledge ("spectator theories") regard the object of knowledge as capable of possessing existence antecedent to the procedures of inquiry. Pragmatism, on the other hand, finds it paradoxical to suppose that if knowledge arises only as the result of such procedures, what is known should yet have existence independently of inquiry. For instrumentalism, accordingly, "the object of knowledge is not something with which thinking sets out, but something with which it ends, something which the processes of inquiry that constitute thinking themselves produce."[1] The process of thinking "terminates when an object is present: namely, when a challenging event is endowed with stable meanings through relationship to something

[1] John Dewey, *Essays in Experimental Logic*, p. 334.

extrinsic but connected."[2] It is this terminal object which pragmatism takes as the *true* object of knowledge, and which is, in consequence, declared to "reside in the consequences of directed action." "Known objects," in short, exist only "as the consequences of directed operations."[3]

2. *Evidence for this position: scientific objects as conceptual in nature.* When we come to examine the evidence for this doctrine, we find in certain writings of Dewey a line of thought which *seems* to treat scientific objects—objects of knowledge *par excellence*—as abstract and wholly conceptual in nature. Much of the polemic of *The Quest for Certainty*, for instance, is directed to saving us from the mistake of thinking that "physical scientific objects" are somehow "duplicated real objects." As Dewey views the matter, there is no need to think that the objects of science are "individual, existential objects," lying in another realm of being from that of immediately experienced objects. The "physical scientific object," it is pointed out, "cannot be taken to be a single or individual thing in existence."[4] "The physical scientific object, as scientifically defined, is not a duplicated real object, but is a statement...of the relations between sets of changes the qualitative object sustains with changes in other things."[5] It seems, indeed, "almost too obvious for mention that a scientific object consisting of a set of measurements of relations between two qualitative objects, and itself accordingly non-qualitative, cannot possibly be taken, or even mis-taken, for a new kind of 'real' object which is a rival to the 'reality' of the ordinary object."[6] "Scientific objects as statements of these inter-relations are instrumentalities of control,"[7] "ways of thinking" created by inquiry for the more effective manipulation of the objects of direct experience. Scientific objects are also described as "generalizations, on a statistical basis"[8] and identified with "numbers," constituted by measurements.[9]

[2] Dewey, *Experience and Nature*, p. 326.
[3] Dewey, *The Quest for Certainty*, p. 200.
[4] *Ibid.*, p. 240.
[5] *Ibid.*, p. 131.
[6] *Ibid.*, p. 130.
[7] *Ibid.*, p. 128.
[8] *The Philosophy of John Dewey*, ed. P. A. Schilpp (Library of Living Philosophers), p. 568.
[9] Dewey, *The Quest for Certainty*, p. 130.

If these descriptions of scientific objects as "numbers," "generalizations," "sets of measurements," "statements of relations," etc., are to be taken literally, it may be admitted forthwith that such objects do not possess being apart from inquiry. But this line of thought, although it promises to be of aid in avoiding an epistemological dualism, and although it has the merit of making clear the sense in which scientific objects can be said to depend for their existence upon inquiry, seems plainly positivistic in trend and appears to bring with it consequences quite as objectionable as those it seeks to avoid. Taxed by Reichenbach with certain of these consequences, however, Dewey has insisted that his view is not to be construed in a positivistic sense. True, it had been expressly declared that "physical scientific objects" are not "individual, existential objects." But evidently assertions to that effect were by no means intended to imply that physical scientific objects do not exist. Dewey's correction of Reichenbach's misinterpretation of his real meaning is supplied in a passage where he seeks to explain more fully what was meant by such a typical assertion as, "The perceived and used table is the only table":

> This passage, because of the word *only*, might be taken to deny that a scientific physical object exists. If the passage had read: "The perceived and used table is the only *table*," the italics might have warded off misinterpretation. For it would have indicated that it was not the existence of a swarm of atoms (electrons, etc.) in rapid movement which was denied, but the notion that this swarm somehow constitutes a ghostly kind of *table*, instead of being just what it is in terms of electrons, deuterons, etc. One would hardly put books or dishes on the latter, or sit down before it to eat.[10]

Such objects of science as atoms, electrons, etc., are thus fully as real as the tables and chairs of ordinary experience. With keen enough vision, we might perceive atoms—provided that "in sensibly perceiving them we explicitly identify them as having all the relational properties required by the scientific theory of atomic structure."[11] "In other words," adds Dewey, "it is not just the thing as perceived, but the thing as and when it is placed in an extensive ideational or theoretical context *within which it exercises a special office* that constitutes a distinctively physical scientific object."[12] Reichenbach's error in construing the pragmatic version of scientific objects as positivistic in tenor

[10] *The Philosophy of John Dewey*, p. 537.
[11] *Ibid.*, p. 538.
[12] *Ibid.*

rests, Dewey suggests, on his belief that "my identification of the scientific object with relations, instead of with some kind of existing non-relational things, commits me to the doctrine of the 'non-reality' of scientific objects."[13] For pragmatism, however, *relations* possess quite as much empirical reality as do *things* and *qualities.*

It is doubtful whether the above explanation entirely removes the ambiguity which attends Dewey's exposition of this part of his philosophy. *The Quest for Certainty* identifies scientific objects with "generalizations," "numbers," "*statements* of relations," etc. The passage just cited insists that scientific objects are to be identified not with such wholly conceptual entities but with *relations* existing between real things. Now there is an obvious difference between, e.g., *relations,* and *statements about* relations. If we are to take at face value the numerous assertions which identify scientific objects with generalizations *about* relations, then it plainly follows, as *The Quest for Certainty* itself maintains, that scientific objects are *not* existential objects; and it is equally plain that such objects would depend upon inquiry for their existence. But if we are now asked to identify scientific objects with *relations,* and to believe that they are capable of being sensibly perceived, what evidence is there that they do not exist apart from the procedures of inquiry?

3. *Scientific objects as existential in nature.* Abandoning a positivistic interpretation of the scientific object as unwarranted, and taking the latter not just as "a thing perceived" but "a thing as and when it is placed in an extensive ideational or theoretical context within which it exercises a special office," in what explicit sense shall we find such an object to be dependent upon inquiry for its existence? The definition just noted is presumably equivalent to the position that a "physical scientific object" (like, indeed, any known object) is a "natural existence clothed with meaning." Since the meanings with which the natural existence is clothed do not eventuate until the conclusion of inquiry, neither does the physical scientific object. That "physical scientific objects," or any "objects of knowledge," as so defined, are constituted as a result of inquiry will then follow directly, merely *ex vi termini.*

4. *Ambiguity of the expression, "object of knowledge."* But if

[13] *Ibid.,* p. 535.

pragmatism intends something more than an exercise in verbal maneuvering, if it intends to strike a body blow at the "spectator theory," it must show something else. For "object of knowledge," outside the writings of pragmatists, means, not an associated complex of an existential event with its meaning, but rather that object about which inquiry is concerned, about which it yields knowledge or warranted belief, and to which inquiry, if it is to be successful, must conform itself. What needs to be shown, if pragmatism is to carry through a veritable revolution in epistemology, is that, in the context of a given inquiry, the object of knowledge, as defined by pragmatism, is also that object about which that inquiry yields warranted belief. Otherwise the "spectator theory" remains unchallenged, insofar as it contends that we can, from inquiry, derive warranted belief about an object in being independently of that inquiry and antecedent to it.

In order to avoid the confusion which surrounds the use of the word "object," let us designate as an "ontological object" the "event" or "natural existence" which, through its original lack of connection with other such existences, provoked inquiry; and as an "epistemic object" the same existence as endowed with the meaning which the inquiry established. A "physical scientific object," as the model for any object of knowledge, is thus being implicitly defined by the pragmatist as an instance of an epistemic object.

In terms of this distinction, our question then is this: A given inquiry begins with a challenge thrown out by some puzzling ontological object. It ends when the meaning of this ontological object is grasped, or, in other words, when an epistemic object is constructed. In the context of a given inquiry, about which of these two objects do we succeed in obtaining warranted belief?

5. *Failure of pragmatism to refute the "spectator theory."* For clarity, the question may be posed with reference to some particular case of scientific inquiry. A certain "natural existence," perceived by us as a shadow cast on the face of the moon, challenges us to inquiry. This natural existence, challenging or problematic because its relations to other existences are unknown, is, with respect to the present inquiry, an ontological object; and our inquiry has for its task the disclosure of these connections, or, what comes to the same thing, the endowing of this natural existence with meaning. When the inquiry is completed,

an epistemic object is created: viz., the natural existence *qua* endowed with the meaning, "eclipse." It is this epistemic object constructed through inquiry which for pragmatism is the "true" object of knowledge.

But about which object has the inquiry yielded warranted belief or knowledge? Clearly, what we now possess warranted belief about, what is now meaningful to us, is the natural existence which antedated our inquiry. Inquiry, if it is to have any value, must yield knowledge about its problem, and its problem was to ascertain the meaning of something that existed prior to it. To be sure, inquiry may be said, if we please, to have as its objective not something past but future; to have as its aim the construction, through experimental operations, of a *new* object; and we may also, if we wish, designate the new epistemic object created as the "true" object of knowledge. Such a manner of speaking, nevertheless, cannot conceal the fact that to construct this epistemic object is to establish the meaning of the originally challenging natural event; and to do that is in turn equivalent to understanding or knowing the latter. The fact remains that to the degree our inquiry is successful, it does yield knowledge concerning antecedent existence. To suppose anything else whatever is to assert that while it takes aim in one direction, unfortunately its arrows always fly off in another: in short, it is to involve us in complete skepticism.

The plausibility of the pragmatic attack upon the "spectator theory," insofar as that theory maintains merely that antecedent conditions may be truly known, rests largely upon the double sense in which the expression "object of knowledge" is employed. In one sense of the term, it is a truism to declare that inquiry creates objects of knowledge; in another sense, we obtain, certainly a novel, but groundless and in fact false position. The pragmatic argument rests upon the device of employing the truistic sense to establish a dependence of "objects of knowledge" upon experiment, and then shifting to the ordinary meaning of the phrase in order to produce the illusion of a destruction of the traditional view. A related ambiguity is more directly evident in such a typical assertion as, "Only the consequences of experimental operations constitute known objects." If this assertion means that only through inquiry *is an object constituted as known*, the statement is truistic, declaring merely that epistemic objects eventuate only through thinking. If it means that only through inquiry *is constituted the object*

known as a result of that inquiry, the assertion is false. No inquiry yields knowledge about the epistemic object *it* creates, but about an object which with respect to it is ontological. To gain knowledge about the epistemic object created by a given inquiry would be the concern, not of that inquiry, but of a second, and purely historical one. We may cite another instance of the same ambiguity. "It is a truism," Dewey declares, "that, while one is engaged in knowing, the things to be known are still future."[14] It is indeed a truism that, while one is engaged in inquiry, the status of being known will not apply to the object about which we are inquiring until some time in the future. It is not a truism, but on the contrary a false proposition, to assert that while one is engaged in a given inquiry, the object about which knowledge is to be gained is future to that inquiry. Pragmatism seems to wish us to pass from the truism that the object is *to be known* to the false proposition that the *object* to be known is itself yet *to be*. If it were not already in being, there could be no occasion for inquiry to take place. What is *to be* is the *being known* of the object, not the being of the object to be known.

6. *When is knowledge not knowledge? Admission by pragmatism of knowledge of antecedent conditions.* But here again the "real" view of pragmatism, when such considerations are pressed upon it, turns out to be most elusive. In spite of countless complaints against the "spectator theory" of knowledge, in spite of countless statements to the effect that "the true object of knowledge does not have being prior to being known," that "knowledge is not a disclosure of antecedent reality," Dewey has recently indicated that it is a misinterpretation of his position to suppose that "antecedent objects are not capable of being known." In reply to some penetrating criticisms of his theory by Professor A. E. Murphy, Dewey has declared:

> Mr. Murphy is not alone in being troubled by my denial that antecedent conditions constitute the object of knowledge. *If* I have written anything affirming that antecedent objects are not capable of being known and are not as matter of fact known, *if*, in Mr. Murphy's language, I have asserted their "inaccessibility," any one, myself included, ought to be troubled. But the trouble arises from confusion of the contexts in which certain statements are made. There is in a given practical and scientific inquiry the question as to what the objective of knowing is for that particular inquiry. There is the question in the form of inquiry constituting logical theory as to what the object of knowledge is and means—a

[14] *The Philosophy of John Dewey*, p. 562.

problem I did not invent. Instead of denying that unperceived antecedent conditions are objectives of knowledge in the first context, I have very explicitly stated that no problem as to existential matters can be resolved except by inquiries which *ascertain antecedent conditions not previously observed.* I have also then pointed out that such objects do not fulfill the conditions which must be satisfied in a philosophical logical theory as to the *generalized* meaning of the category, "object of knowledge." That is ...I have said that such objects are not *final and complete* with respect to satisfying the conditions that must be satisfied, in philosophical inquiry, by a candidate for the position of object-of-knowledge in this latter context....

If the distinction between the particular object of a particular inquiry as such and the object of knowledge in its philosophical-logical sense is denied, then... there is *no* philosophical problem or theory of knowledge. It suffices to enumerate, without analysis, all the special cases of knowing for which one has time....

I hold (i) a philosophic logical theory of knowledge can be framed only in terms of properties that analysis finds to belong to attained objects of knowledge; and (ii) that physical scientific objects, when taken as models for framing such a theory, prove, through their dependence upon experiment...that existential consequences must be taken into account in forming the theory; (iii) that instead of denying that antecedent conditions are accessible to inquiry or knowing, I hold that all physical scientific objects are precisely generalizations, on a statistical basis, of such antecedent conditions, but (iv) that they nevertheless do not stand alone, or as "final and complete" fulfilments of the conditions involved in inquiry.[18]

7. *Recurrence of the positivistic treatment of scientific objects.* If we are to take the last sentence at its face value, we find once more a reversion to the positivistic conception of scientific objects disowned in Dewey's reply to Reichenbach in the same volume. Scientific objects are expressly declared to be "*generalizations,* on a statistical basis"—and therefore to be dependent upon inquiry for their existence. Yet, as noted earlier, these same objects are also supposed to swarm about in space, and to be capable of being sensibly perceived. Possibly, what is meant here is that we require "generalizations, on a statistical basis," in order to form a *conception,* say, of an electron, and that without forming such a conception we cannot be said to be sensibly perceiving an *electron,* but only, perhaps, a meaningless spot of light. Similarly, we might deny that primitive man ever sees an *eclipse,* meaning that an epistemic object other than "eclipse" confronts a primitive. But this interpretation of the scientific object has already been considered and shown not to touch the question whether antecedent conditions can be truly known. Does the remainder of the passage quoted bring

[18] *The Philosophy of John Dewey,* pp. 565–568.

out any argument of a type not yet considered in support of the pragmatic position?

8. *Outline of the argument.* To the writer, the general argument of the passage unfortunately remains somewhat obscure. The passage seems, however, to assert (a) the existence of a type of inquiry known as "logic," which seeks "the *generalized* meaning of the category, object of knowledge." Presumably this means that logic sets up as a criterion some generic characteristic C, which any object must possess if it is to be stamped "finally and completely known." (b) Antecedent conditions, lacking in this characteristic, are disqualified by logic as candidates for this honor. They may be "ascertained," they may even be "as matter of fact known," but they are never *truly* known. (c) Apparently, they can only be "known," and not "truly known," because, being objectives of knowledge for *particular* inquiries, they lack the *generic* characteristic demanded by logic.

9. *Discussion.* (1) What is the distinction between being ascertained or known, and being "truly" or "validly" known? One is forced to guess. Might it refer to the distinction between knowledge that is only probable as opposed to knowledge which is certain? One gathers, however, that the "quest for certainty" is now outmoded, at any rate in pragmatic circles. Whatever the distinction may be, it would seem to be incapable of application. For if any problem as to existential matters can be solved only by ascertaining antecedent conditions, would not any sort of deficiency in our knowledge at this point infect all existential knowledge? If so, nothing could be "truly known," in which case the distinction would cease to have any real application.

(2) Whatever may be the difference between being known and being "truly known," at any rate the argument which seeks to deprive antecedent conditions of the latter eulogistic description seems not to bear examination. It is admitted that an object existing antecedent to a particular inquiry may be an object about which that inquiry yields knowledge—of a sort. But, as being the *particular* object of a *particular* inquiry, it is supposed to lack the *generic* characteristic in which logic is interested. Here one is driven to ask: What objects could possibly satisfy the demands of "logic"? The task of this science is to analyze the properties common to "attained objects of knowledge." Knowledge is attained, however, only in the form of particular conclusions of

particular inquiries into particular objects. If to be the object of a particular inquiry debars that object from possessing the characteristic sought by "logic," that science should, if it is logical, come to the conclusion that nothing is ever "truly known." In such an event, antecedent conditions will fare no worse than anything else; and logic, which claims the authority to set up a test for "true and valid" objects of knowledge not met by anything whatever becomes, not an illuminating investigation of the procedures of science, but as self-stultifying a discipline as any conceivable. Indeed, logic would seem to fall within its own indictment; for, after all, it is itself a particular inquiry, with a particular object, viz., certain antecedent matters of fact, such as the procedures and principles of science.

That the argument proves too much is plain. What is not so plain is its course. To the writer, it seems to turn on a confusion of the methods of inquiry known as logical with the content of the inquiry known as logic; and to suppose that where the latter is absent, as in, say, an astronomical investigation, so also are the former. In the context of astronomy, the scientist is investigating some particular natural phenomenon. His inquiry is less general in its scope than is that of logic. But what follows from that fact? If it could be established that because he is not doing logic, he is therefore not being logical, we could throw suspicion upon the results of his inquiry, showing them to be deficient in some respect. From no other assumption whatever would anything follow as to the merits or demerits of his results, merely from the fact of the nature of his interest. That his interest is more specific than that of the logician cannot of itself possibly affect the validity of his conclusions, but only their type and range. The astronomer need not *talk* logic; it is sufficient that he *use* it. And if his methods are logically proper, there is no indictment on which logic can arraign him.

Logic, as the "theory of inquiry," might perhaps be described as interested in a generic characteristic possessed by the particular objects of those particular inquiries which have demonstrably yielded warranted belief. That the particular inquiries approved by logic do not themselves direct attention upon this generic characteristic does not imply, however, (as the argument implicitly assumes) that their objects lack it. If they did lack it, nothing could confer it upon them. In that case, there would be no inquiry whatever the results of which logic could approve. If they do not lack it, then the mere fact that ante-

cedent conditions are particular objects of particular inquiries entails no disqualification of their candidacy for the honor (whatever it may be) of being "truly known."

(3) The description of logic as concerned with an investigation of the properties common to "attained objects of knowledge" is, however, unfortunate, for it is subject to the ambiguity already shown to characterize the expression, "object of knowledge." Any such investigation requires a denotation with which to commence, and this denotation in turn rests upon some provisional definition of the term, "object of knowledge." If by this phrase we mean objects about which we possess warranted belief, we shall not find in logic any ground for supposing that antecedent objects are not known with as much validity as is possible to human beings. If we mean by the phrase what has been termed an epistemic object, we shall, of course, find that such objects are dependent upon inquiry. As already pointed out, however, this "discovery" does not represent a new insight provided by pragmatic logic; it is simply a consequence of a certain linguistic convention.

10. *Knowledge and practice.* Is there any remaining ground on which it might be asserted that antecedent conditions are not "the characteristic objects of the knowledge-function," that they are not "truly known"? One recalls at this point the pragmatic view that "every judgment is a judgment of practice," a judgment about "the better course of action to follow in the future"; and that inquiry into the past, as a means to this end, is only a stage within the process of inquiry, not its termination. It may be doubted whether this view can be upheld and still assert anything significant. But even if we suppose that inquiry into antecedent conditions is undertaken only with a view to directing "practice," we shall find no grounds on which to impugn the "truth" of such knowledge. In a court of law, for example, we have a situation where we are admittedly interested in reaching a *verdict* about what occurred in the past in order to pass a proper *sentence* upon the accused. But here there are two inquiries: that of the jury into the proper verdict, and that of the judge into the proper sentence. The first inquiry is completed before the second begins *and is logically independent of it.* The whole proceeding would be meaningless if this were not so. No error of the judge, for instance, in considering what sentence should be meted out, affects in any way the soundness of the

verdict, assuming the latter has been rationally based upon the available evidence. If the jury has done its task properly, it has attained the "final and complete fulfilments of the conditions involved" in *its* inquiry. A logic which sets out to prove that no jury, however competent and honest, can obtain valid knowledge about past occurrences, simply because they are past, or because its inquiry is "too particular," less general than that of the logician, would seem to be an odd champion indeed of intelligence in the modern world.

11. *Conclusion.* Has pragmatism, then, offered us an account of the objects of science, and of objects of knowledge in general, which is at once novel and cogent? The answer depends upon how pragmatists really wish to think of such objects. If, when the objects of science are described as "generalizations," "statements," "numbers," etc., these descriptions are to be taken at face value, it is plain that such entities, being wholly conceptual in nature, are literally created through inquiry; but such a positivistic doctrine is not original with pragmatism, and is in any event difficult to maintain seriously. If, instead, scientific objects are held to be existential objects, "natural existences" *qua* endowed with the meanings they possess in science, it may again be admitted that such *epistemic* objects are created through inquiry. But in that event pragmatism has left the "spectator theory" untouched, insofar as that theory maintains that a given inquiry yields knowledge not about the epistemic object it creates but about the ontological object which in the beginning aroused inquiry by its problematic status. It is only by an inconsistent wavering between the pragmatic sense of the term "object of knowledge," and the traditional sense, that the spectator theory seems to be impugned. Finally, the argument which concedes that antecedent conditions may be known but seeks to deny that they are ever "truly known," turns out on examination to be untenable; and, moreover, by involving logical inquiry itself in its indictment, robs logic of any epistemological authority to which it may lay claim.

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DISCUSSION

C. I. LEWIS' ANALYSIS OF KNOWLEDGE AND VALUATION

PROFESSOR LEWIS' CARUS lectures[1] comprise three books and an introduction. Their ultimate objective is to develop (in Book III) the thesis that valuation is a form of empirical knowledge. The nature of empirical knowledge is the topic of Book II; that of a priori knowledge, of Book I. The treatment has the originality and technical expertness which have marked Lewis' earlier publications, and the book is undoubtedly one of the major modern contributions to basic philosophical theory. Any number of questions of fundamental importance are subjected in it to penetrating analysis.

The book is tacitly addressed to technically equipped students of philosophy, although some pages here and there would be rewarding to the more thoughtful general reader. The style is lucid enough but it assumes interest on the reader's part in the questions discussed rather than makes any attempt to arouse it. The presentation is rather prolix, often repetitious, and devoid of dramatic quality. There are many places where greater terseness would have given more psychological punch to Lewis' contentions.

In this reviewer's opinion, the third book is the best of the three and is mostly excellent; the second book is on the whole sound but less adequate; and the first, which is the most technical, is at many points open to serious criticisms.

I

Book I is entitled "Meaning and Analytic Truth" and argues that not only are all analytic statements true a priori, but all a priori knowl-

[1] *An Analysis of Knowledge and Valuation* (La Salle, Illinois: Open Court Publishing Company, 1946.)

edge is analytic in the sense that it is obtained by analysis of what our statements "mean," that is, by analysis of the "criteria-in-mind" by which we determine the applicability or nonapplicability of linguistic expressions to concrete cases.

Lewis distinguishes four modes of meaning and holds that all terms have meaning in all four modes. He defines a term as "a linguistic expression which names or applies to a thing or things, of some kind, actual or thought of" (p. 38). To cover cases where the things named are the members of a null class, he rephrases this to read that a term is "an expression capable of naming or applying to a thing or things, of some kind" (p. 39). He does not define "naming." The four modes of meaning are then defined as follows:

> (1) The *denotation* of a term is the class of all actual things to which the term applies.
>
> (2) The *comprehension* of a term is the classification of all possible or consistently thinkable things to which the term would be correctly applicable.
>
> (3) The *signification* of a term is that property in things the presence of which indicates that the term correctly applies, and the absence of which indicates that it does not apply.
>
> (4) Formally considered, the *intension* of a term is to be identified with the conjunction of all other terms each of which must be applicable to anything to which the given term would be correctly applicable (p. 39).

Lewis develops the bearings of this scheme of modes of meaning with great technical skill. The scheme itself, however, seems to me unsatisfactory. For one thing, not four only, but sixteen modes of meaning result from the distinctions that have to be made, and which Lewis seems to recognize either tacitly or explicitly. But space is not available here to describe and illustrate each of the sixteen, as would be necessary to substantiate this criticism. But further, Lewis' scheme as it stands seems to me open to several objections. One of them at least must be considered in some detail, since, if it is well taken, it affects the validity of the main contention of Book I.

It has to do with Lewis' account of denotation. It is puzzling to read that the denotation of a term is "the class of all *actual or existent* things which the term correctly applies to or names" (p. 39, italics mine), and then be told that this class may nevertheless be *empty* (p. 40). The notion of a null or empty class is of course familiar and useful, but if the specification "actual or existent" means anything, I submit this can be only that the class referred to is *not* empty. For, as Kant pointed out in his criticism of the ontological argument, actuality or existence is no part of the *description* or *nature* or *character*

of anything: Dollar bills that exist and dollar bills that do not exist have exactly the same description, and therefore are not different kinds or species or classes of dollar bills, as on the contrary would be green dollar bills, red dollar bills, triangular dollar bills, and so on. Yet Lewis here treats actuality or existence as if it were a *character*, like color or shape, and thus capable of entering in the specification of a *kind* of thing, that is, of something essentially capable of having *or lacking* actual or existent members.

Of course, the words "actual" and "existent" are adjectives; but it is of crucial importance to realize that not all adjectives are *quiddative* ones—that not all stand for properties, attributes, or other aspects of the *nature* of something. Those two adjectives in particular predicate not *what* their subject is, but *that* it is. They are *existential*, not quiddative. It is legitimate to refer sometimes simply to "things of kind K"; sometimes to "nonexistent things of kind K"; and sometimes to "existent things of kind K" and, if we choose, to label the latter, say, "*the Q's.*" But it would *then* be illegitimate, because self-contradictory, to speak of "*the Q's*" that do not exist, for this would be to speak of "existent things of kind K that do not exist." This, however, is what Lewis does in effect when he defines denotation as a class of existent things and yet speaks of it as possibly null.

Lewis notes that "in common speech, a term is said to denote the existent or existents to which it is applied on any given occasion of its use," but goes on to say that "even if a term correctly applies to one existent only, as is the case with all singular terms, it is still doubtful to identify this one object denoted with the class of which it is the only member; and it is the class which is the denotation of the term" (pp. 39, 40). It seems to me, however, that, behind the "awkwardness" Lewis notes in this conflict of modes of speech, there is a vicious ambiguity of the term "class" as he and others use it. The following remarks attempt to exhibit it.

A *character* can be used, as class-character, to specify a "class" *in the sense of a "kind" or "species."* So to specify a "class" leaves wholly open the question whether any things of the kind specified exist.

On the other hand, a "class" *in the very different sense of an "enumeration"* (W. E. Johnson's term) or "itemization," can be specified by *indication* of individual items (e.g., this and that and that) or of groups of items (these and those and those) or *by mention of the names of items* (Socrates and Guatemala and the Renaissance). Then, however, the question whether the "class" so specified does or does not have existent items is *not* left open, for the "class" was in this case

specified *solely* by listing various existent items. But a different question— the inverse of the former—is then left open, namely, whether or not those existent items, which of course can be as heterogeneous prima facie as one pleases, *happen to have in common any empirical characters*—any characters other than the extrinsic and a priori one of having been picked. That is, the question then open is whether the picked items happen to be objectively *akin* and thus in themselves to constitute a *kind*; and if so, which kind. This question, like that as to whether any cases of a given kind exist, can be answered only through empirical investigation.

It is vital to be clear as to which of these two things—a kind or an enumeration—one is referring to when on a given occasion one speaks of a "class," for, obviously, a "class" cannot be specified, in *both* at once of the ways mentioned. It might thus be better to give up altogether the ambiguous term, "class," and to speak instead explicitly either of a kind, possibly empty, or of an enumeration, possibly heterogeneous. At all events, the term "member of a class" (or "things to which the class name is applicable") means something very different, according as, by a "class," one means a kind or an enumeration.

In the latter case, "the members" means *the existents themselves*, which were enumerated. In the former case, on the other hand, if the kind one has specified happens to be empty, it is then not legitimate to speak still of *the members* of it *unless* one now means by this term, not existents, but *the various infimae species* of the genus determined by the character specified.

An example of an *infima species*, or "member" in this sense, of, say, the class of colors, would be any *completely determinate color;* for example, the determinate shade of blue now exemplified at a certain place on my necktie. That shade of blue is *completely* determinate—determinate as to hue, as to brightness, and as to saturation—and therefore does not itself have species. Yet *it* is a species—a kind, not an existent—since it is possible and legitimate to ask, about it, which other existents, if any, besides that part of my necktie, exemplify it; and also legitimate to suppose that that determinate shade of blue might never have been exemplified, and that, at any moment, it might cease to be exemplified by any existent. Obviously, when "class" means "kind" and "member of a class" means "*infima species*," every class has members, although it is then possible that no existent exemplifies them. These members are "particular" in the sense that the nature—the "what"—of each is completely determinate; but not necessarily "particular" in the sense of exemplified by some existent.

These remarks perhaps provide a clear meaning for Lewis' definition of the *comprehension* of a term as "the classification of all possible or consistently thinkable things to which the term would be correctly applicable." His use here of "classification" (which he does not explain), where "class" would have suggested itself, is puzzling; and so is what he may mean by "things." The only meaning both clear and legitimate, which I can attach to his definition, is that the comprehension of, say, the term "blues," consists of all the *infimae species* (in the sense just discussed) of the "class," i.e., the *kind*, which "blues" names; and of each of which it would always be possible to say that it is *a blue*, irrespective of whether or not any existent happens to exemplify either it or any of the other determinate blues. This would be a "classification" of blues in the sense that they would be all the *determinate kinds* of blue there are (no matter whether or not any existents are *cases* of any of those kinds).

Bearing in mind the distinction between "class" in the sense of "kind," and in the sense of "enumeration" of existents, let us now return to Lewis' statement quoted above as to "denotes" and "denotation." When he insists that "it is the class which is the denotation" even in the case of a singular term, in which of those two senses is "class" to be understood?

If "class" means here "enumeration," then the class *consists of* (not, contains) solely the one item enumerated and cannot be null. On the other hand, if, as Lewis says, the "class" which is the denotation can be null, then "class" means *kind*. But *then*, there is no place in Lewis' official scheme of modes of meaning for terms that name *existents*, or unique places or times, that is, for terms that are *essentially* indicative, monstrative—terms such as "myself," "you," "this," "here," "now," "America," "Adolph Hitler," etc.[2]

Hence, when Lewis, in the passage quoted, speaks of singular terms as correctly applying to one *existent* only, he is thereby tacitly acknowledging a mode of meaning (commonly called denoting) *other than and additional to what he calls the denotation of a term*, which he

[2] And also terms of the form "the so-and-so" *when the whole of their meaning is understood*; for a term such as "the King of the U.S.A. in 1947" does not merely describe and ascribe uniqueness, but *also and essentially* purports to *indicate that existent* which alone has the description. Indeed, the description is merely instrumental to the identifying of the existent, But if no existent has it, the indicative function of terms of that form fails to take place; and this means that the *denotative* part of the term's purported meaning is then *not understood*. For to understand the denotative meaning of a term is to identify the existent which the term virtually *points at*; and that is something different from understanding in the sense of grasping the intension of a term.

insists is a *class*, not the individual existent which is its member. Thus, according to Lewis' official scheme of modes of meaning, *there are no terms whose meaning consists of existents themselves*, i.e., no strictly *indicative* terms, and therefore *no way of talking about existents as such* but only about the classes of which they possibly are members. And this, I believe, is a radical defect in his scheme of modes of meaning; moreover, it is one which, as will appear, has far-reaching consequences. Some of them appear in his conception of propositions and of their truth.

II

A proposition, for Lewis, is a linguistic expression. More specifically, it is "a term capable of signifying a state of affairs" (p. 48). A *statement*, on the other hand, contains in addition the element of assertion, but this element is extraneous to the proposition asserted. Thus, in the statement "Mary is making pies," the proposition concerned is: "Mary making pies now"; and this same proposition can, instead of being asserted, be denied, questioned, supposed, or entertained in yet other "moods." He then writes: "...the state of affairs... is the *signification* of the proposition: not its denotation. 'Mary is making pies' asserts that the state of affairs, Mary making pies now, has a certain status; namely that it is actual; that it is incorporated in the real world. And if this statement is true, then the denotation or extension of the propositional term, 'Mary making pies now,' is not the limited state of affairs which it indicates, but is the actual world which incorporates that state of affairs and is characterized by it" (pp. 51, 52).

The following criticisms suggest themselves:

(a) Lewis defined the *signification* of a term as "that property in things the presence of which indicates that the term correctly applies, and the absence of which indicates that it does not apply." Now, I submit that what the words "Mary making pies now" formulate is no *property*. It is a state of affairs, but a state of affairs is not a property. That state of affairs consists of (i) an existent, denoted by "Mary"; (ii) a kind of occupation, called "making pies"; (iii) a certain time, denoted by "now"; and (iv) the (unasserted) relation "character of" between that kind of occupation and Mary—this relation being symbolized by the syntactical form of the phrase. Thus, the state of affairs, Mary making pies now, *comprises* a character or (loosely speaking) a property as *one* of its constituents but is not itself a character or property. It is an (unasserted) predication *of* a property, *about* an individual

existent woman, but is not *itself* a predicate; nor is the expression which formulates it, viz., "Mary making pies now," a predicable expression as Lewis unjustifiably asserts (p. 52). This follows from the fact that the term "Mary," as used in "Mary making pies now" is essentially denotative, i.e., indicative, monstrative—capable, if one were in the same room with the woman concerned, of being replaced by a pointing gesture. That is, the term "Mary" as functioning in that phrase is not equivalent to the term "being called 'Mary' "— which, of course, does formulate a property, determining a kind.

Thus, if the expression considered had *not* been "Mary making pies now," but instead "being called 'Mary' and making pies now," *this* expression indeed would have formulated a property—but then *not a state of affairs*, for lack of a substantival constituent in addition to a property. Moreover and patently, one could not say that *the real world* is called Mary and making pies. This predicate is predicable truly only of some existent woman or women.

(b) Lewis has declared that if the statement "Mary is making pies" is true, then "the denotation of the propositional term, 'Mary making pies now,' is not the limited state of affairs which it indicates, but is the actual world..." (p. 52). He has also declared that the denotation of a term is a *class* (p. 40). These two declarations together entail that the *actual world is a class*, and moreover, since for him the class which is the denotation can be null, a class in the sense of a *kind*. I submit that the actual world is not itself a kind.

(c) If I should use the expression "The dollar bill in my pocket..." and yet there were no dollar bill there, then, in this mere using of that expression (i.e., no matter what I might go on to assert about that dollar bill), I should be either lying or mistaken, for the expression means "There is one and only one dollar bill in my pocket, and it..."; and this in itself is already an *assertion*. Now, the expression "the real world" analyzes in exactly the same way. It too is a (tacit) assertion, viz., "there is one and only one real world, and it...." But an assertion is either true or false. Would Lewis propose to define the truth *of this assertion too* as consisting in incorporatedness of the state of affairs it asserts (viz., one-and-only-one real world existing), into, again, the real world, etc., *ad infinitum*? I submit that, to ascertain the truth or falsity of the assertion "Mary is making pies," one need not concern oneself at all with "the whole of reality." It is only necessary to observe *the woman herself and her occupation*, and note whether the latter is of the kind called "making pies."

(d) There remains to comment on a reason Lewis gives for saying that the denotation of a true proposition is the actual world. He states that "when a term denotes a thing that thing must likewise be denoted by one or other of every pair of mutually negative terms which could meaningfully be applied to it. That is what is required by the Law of Excluded Middle." He goes on to say that "if what 'Mary making pies now' denotes should be the limited state of affairs, Mary making pies now, this same state of affairs should likewise be denoted by 'It being hot' or by 'It being not hot,'" but that "either of these alternatives is simply outside the state of affairs in question and irrelevant to it" (p. 52).

As to this, it must be remarked first that to say those alternatives are irrelevant to it is precisely to say they cannot ***meaningfully*** be applied to it; for "meaningfully," in this context, means "congruously," "without incongruity," "without irrelevance" — incongruity being what occurs when one applies a predicate to something outside that predicate's limited universe of discourse, e.g., when one applies the predicates "green" or "not-green," or "married" or "single," etc., to, say, the square root of 2, or to the Law of Gravitation, etc. To do this is to violate the Law of Excluded Middle as to that limited universe of discourse. But then, when one says that what the Law forbids is a middle between a pair of "mutually negative" terms, one has to decide whether, by so speaking of them, one means (besides the mutual negativity) that they together exhaust a ***limited*** universe (as "green" and "not-green" exhaust the universe of colors), or, on the contrary, means that they together exhaust the ***entire*** universe. The latter is what logicians commonly mean; but if this is what one means, there is then no longer any such thing as incongruity or irrelevance of a given predicate to some subjects; i.e., the Law of Excluded Middle then cannot be violated. And one ***must*** then say that "not-green" does denote the square root of 2, and likewise that "it being not hot" *does* denote Mary making pies now. Lewis, in the passage quoted, apparently chooses (by the qualification "meaningfully" and his requirement of relevance) the interpretation of the Law of Excluded Middle that has reference to a limited universe, and yet he bases on that law a conclusion warranted only when it is taken as referring to the ***entire*** universe.

If the foregoing criticisms are just, the upshot is that a proposition is not, as Lewis asserts, a predicable term, and that the truth or falsity of a proposition is a matter not of the incorporatedness of the state of affairs it formulates in something independent of it called "the real

world," but of the incorporatedness of the adjectival constituent of that state of affairs *in its substantival constituent.*

III

The remaining chapters of Book I develop an elaborate argument to show as against the conventionalist view that although "rules for the manipulation of linguistic symbols, and the transformation and derivation of expressions, can... be made at will," and what meanings our expressions shall have can be determined at will, nevertheless, the meanings themselves, "which our symbols represent cannot be manipulated at all. And our operations upon expressions and the rules of such operations will be significant and valid only if they conform to relationships of meaning which actually obtain" (p. 97). These relationships are what statements of a priori truths, i.e., of analytic truths, express. They "are capable of determination in advance of and independently of any particular occasion on which expressions apply or fail to apply, through that envisagement of the criteria (of their applicability) of which we must be capable if we know what we mean in the sense of being able to recognize an instance of it when we find it" (p. 157).

This contention is basic in the whole of Lewis' thought. Estimation of its validity, however, is made difficult by obscurities at certain crucial points in these chapters, in particular, by the ambiguity or the vagueness of Lewis' terms "symbol," "meaning," and "linguistic expression."

As to the last, he never actually defines it, but says only that "a *linguistic expression* is formed or determined by the association of a symbol with a fixed meaning" (p. 73). A *verbal symbol*, or linguistic sign, on the other hand, is "a recognizable pattern of marks or of sounds used for purposes of expression or communication"; and he states that "the linguistic expression cannot be identified with the symbol alone." Thus "cat" meaning "feline animal" is a different linguistic expression from "cat" meaning a "kind of whip" (p. 73).

Had Lewis defined a verbal symbol *simply* as "a recognizable pattern of marks or of sounds," the distinction between it and a linguistic expression would have been clear-cut. A "verbal symbol" would then have been simply a *vocable*, but then would not, in itself, have been a symbol at all, but only capable of serving or not serving to symbolize. But his addition of the qualification "used for purposes of expression and communication" incorporates in his definition the requirement that the vocable be *functioning as symbol of* something to be expressed or

communicated; and this something would commonly be called the meaning of the symbolizing vocable. Indeed, in a later chapter, he himself writes: "symbols without meaning are not language, or even symbols" (p. 164). Hence his definition of "verbal symbol" turns out to make this term mean after all exactly the same thing as his term "linguistic expression." Yet it is evident that at several places he is intending to use "symbol" in the sense of "vocable" simply. The ambiguity of the term "symbol" in his pages obscures the fact that what he proposes to distinguish as, respectively, "symbolizing," "expressing," and "representing" (p. 73), are one and the same relation, viz., symbolizing, but as between partly different relata.[3]

For clarity in respect to meaning and language, I submit that the following five things need to be sharply distinguished:

(a) A *vocable*, viz., a recognizable pattern of marks or sounds, readily utterable, and of which instances occur virtually only as a result of human utterance.

(b) The role or function, "*symbolizing*," of which the converse is "symbolized by"; (roughly, "meaning" and "meant by").[4]

(c) A *symbol*, viz., anything, whether a vocable or not, *qua performer of the function "symbolizing."*

Moreover, the ambiguity — as between (a) and (c) — of Lewis' actual use of "symbol" has a close analogue in the ambiguity which affects his term "meaning" and breeds even greater obscurity. For the words, "a meaning," are used by Lewis sometimes in the sense of:

(d) Something *qua player of the role "being meant by"*; and sometimes in the sense of:

(e) Some one of *the entities themselves*, which are capable of playing or not playing that role, but the playing of which is no part of their intrinsic nature.

It is obvious that "meanings" *in this second sense* are independent of being symbolized, whether by vocables or otherwise. But then, to call those independent entities nonetheless "meanings" is as gratui-

[3] Occasionally, moreover, Lewis does not even abide by his own terminological conventions. On p. 101, for instance, he writes (italics mine) that a dictionary definition is "a statement of the form, '«A» *symbolizes* the same meaning that is expressed by *"BC"*'"—in spite of the fact that on p. 73 he restricts "symbolizes" to the relation of a symbol to an *expression* and specifies the term "represents" for the relation of a symbol to the *meaning* of the expression the symbol symbolizes.

[4] I say "roughly" because not only symbols, but also signs, have meaning. But the difference between signs (as, e.g., in "smoke is a sign of fire") and symbols that are not signs in this sense need not be gone into here.

tously and hopelessly confusing as it is to call a vocable, considered simply as such, a "symbol."

Moreover the entities which are "meanings" in this paradoxical sense (e) obviously can be *any whatever* — individual existents, kinds, characters, relations, physical or mental entities or events, or anything else except only players, *as such*, of the role "meant by." Yet Lewis throughout speaks as if those independent entities were of one kind only, which he says is commonly called concepts, but which he describes as criteria in our minds of the applicability of our words.

IV

In the chapter on "Linguistic Meaning and Sense Meaning," Lewis considers at some length the nature of these criteria of the applicability of expressions. The *linguistic meaning* of an expression, he tells us, consists of other *expressions*; it "is intensional meaning in the sense in which what a word means is other *words* and phrases; and what a statement means is other statements" (pp. 131–132).

The *sense meaning* of an expression, on the other hand, is the "*criterion in mind*, by reference to which one is able to apply or refuse to apply the expression in question in the case of presented, or imagined, things or situations" (p. 133). He further characterizes a criterion-in-mind as a *schema* in Kant's sense — "a rule or prescribed routine and an imagined result of it which will determine applicability of the expression in question" (p. 134).

Lewis' account of "sense meaning," however, is complicated by his addition of the requirement "that determination of the applicability or non-applicability of a term, or truth or falsity of a statement, be possible by way of *sense-presentable* characters" (p. 135; italics mine). This entails that, in the expression "sense meaning," the word "sense" is given *both at once* of its two ordinary meanings: (1) that in which "sense" is commonly more or less synonymous with "meaning" (as when one says "I was not using the word 'cat' in the *sense* of 'feline animal' "); and (2) that in which "sense" refers to sensation and the senses, and sense meaning is therefore meaning in terms of characters presentable by the senses.

It is nowhere quite clear whether or not Lewis realizes that, in his expression, "sense meaning," he is using "sense" in both of these two different and independent senses at once. At all events, the second requirement seems to me to entail that such terms as "criterion," "image," "theory," "concept," and so on, have no sense meaning, for

I do not see how, for instance, the applicability or nonapplicability of the term "theory" to something can be determined "by way of sense-presentable characters." Perhaps Lewis' real intention here would have been more accurately expressed if, instead of "sense-presentable" he had said "empirical," *and* acknowledged that there are kinds of experience other than sense observation.[5]

Lewis says something also as to the relation of "criterion in mind" or "sense meaning" to what he calls "signification." In a footnote, he emphasizes that "sense meaning" and "signification" are not the same thing: The signification of a term comprises the properties that are essential in the sense that a thing must have them if the given term is to be applicable to it (p. 41). The sense meaning of a term, on the other hand, is "that in mind which *refers to* the signification" (p. 133 n.); and by "in mind," he states (p. 144) that he means "entertained in advance of instances of application which are pertinent."

He has, however, described a criterion-in-mind as "a prescribed routine and an imagined result of it," and this exactly describes an imagined *property*. (For example, to have the property, "fusibility," is to be such that, when raised to a certain temperature, melting of the substance concerned results.) The criterion-in-mind, then, consists of what would ordinarily be called *one's idea* of a property or set of properties, and the "signification" consists of the property or set of properties *itself*.

Let us now consider for ourselves the criteria in our minds, by which we decide as to the applicability of given words to given cases, and let us see how far what Lewis says actually fits those criteria, and whether or how far they furnish a basis for a priori judgments. As an instance, let us take the term "fish," and note the following seven points:

(1) The criterion by which I decide that a concrete object is or is not a fish consists of *my idea* of what a fish is.

(2) It does not seem describable as being an idea of a prescribed routine and of a result of it. Rather, what introspection reveals is a certain unique intuition, which the sound or sight of the word "fish" instantly arouses in my mind, whereas, in a language totally unknown to me the word for "fish" would not arouse it.

(3) What is true, however, is that this unique intuition (commonly called an abstract idea) institutes in me a readiness (i) for

[5] E.g., it is empirically—by making a trial and observing its outcome—although not by sensory observation, that I discover whether 2,933 is divisible by 9 without remainder; conceivably, a mathematician might be able to tell by signs, deductively instead of empirically, i.e., without making the trial.

certain kinds of experience, e.g., for a certain sort of smell, and (ii) for certain sorts of behavior, viz., those which in given circumstances would be appropriate to my purposes connected with fish. The unique intuition aroused in me instantly by the word "fish" might be thought of as being the feeling of that complex readiness.

(4) Anyway, the idea which I use as criterion of the applicability of the word "fish" was originally acquired by me in childhood through hearing the word applied to various objects, more or less similar to one another in respects mostly superficial and hardly analyzed. That idea has since been somewhat elaborated by scrutiny of such objects and by reading about them, but it is still far from being precise or definitive. And my own case in this respect is undoubtedly typical. The vagueness and superficiality of the actual ordinary criterion of applicability of the word "fish" is testified to by the mere existence of such words as "crayfish," "starfish," "shellfish," "jelly fish"; and by the fact that porpoises and whales are called "fish" by many persons. And the term "whale fisheries" suggests that possibility of being caught by fishing is an important part of the criterion actually used. Equally superficial and vague is the criterion ordinarily in mind in the case of "beast."

Now, I submit that it is not by comparing one's criteria-in-mind in the case of "fish," of "beast," and of "porpoise," that one comes to know that a porpoise is a beast not a fish, and that no fish is a beast. The data, which one studies to gain that knowledge, are not one's intensions-in-mind associated with those words, but are the existents themselves to which one was taught at one's mother's knee to apply those words, and other existents like them perceived since.

Again, the compatibility of the sense-recognizable characters, red and hot, but the incompatibility of red and green, and of hot and cold — which compatibilities and incompatibilities are properties of the entities denoted by "red," "hot," etc. — are known to us a posteriori, not by comparison of our criteria-in-mind for the applicability of those terms; for those criteria are only good enough to enable us in most cases to recognize certain colors or temperatures as entitled to be called "red," "hot," etc.

(5) Special attention must be called to the "if" which conditions Lewis' contention that a priori truths are ascertainable through that envisagement of the criteria "of which we must be capable *if we know what we mean in the sense of being able to recognize an instance of it when we find it*" (p. 157; italics mine). This "if," in fact, is one which ordinary language meets only to some extent. As the examples I have cited illustrate, the usual situation is rather that we know what

we mean by the terms we use *only partially and unprecisely* — well enough to identify with confidence *some* things to which they are applicable, and *some* to which they are inapplicable, but yet so partially and unprecisely in many cases as to leave us in doubt as to whether the term does or does not apply. And, to say, as Lewis does, that "language is not language until it possesses fixed meaning, determining what expressions signify and require as essential for their application" (p. 168) is quite inadmissible. Only the language of the sciences, or indeed only the technical terms in it, would then be language at all.

(6) The actual state of affairs is that, in cases where our empirically acquired, a posteriori criterion-in-mind is too vague or scanty to enable us to decide in a given case whether a term applies or not, we then *sharpen our criterion by decisions ad hoc.* It was such decisions, by zoologists, that *drew* (not *found*) sharp lines between the *meanings* of "fish" and "beast" and "mollusc." Those meanings — meanings in sense (d) above — *were manipulated* by zoologists. And it is *only to the extent that our "meanings," in the sense of our criteria, come to consist of such decisions* that the criteria are essentially antecedent to occasions to employ them. It is true that these decisions are not arbitrary. But that which they aim to portray is not relationships found to exist among our "meanings" *in the sense of our ideas or criteria-in-mind* of "fish," "beast," "mollusc," but relationships found to exist *among the individual existents themselves,* which those words happened, *first,* to denote, and *only thereafter* to connote such characters of, as we noticed present in all of them. Those existents themselves, however, are not "meanings" (except, as noted earlier, in a paradoxical sense) ; and *they,* not our criteria-in-mind, are the things which indeed cannot be manipulated by conventions (but manipulated only in the strict sense, viz., by hand). What thus seems to me here a radical defect in the argument of Book I appears due to the tacit (and I think false) assumption by Lewis, mentioned earlier in my discussion of his view of denotation, that existents are verbally identified by us always through the intension of their names.

(7) Finally, it should be noted that, insofar as our criteria of the applicability of words are *made* by us, through such decisions as mentioned above, the distinction between "criterion-in-mind" and "signification" vanishes; for the signification, i.e., the properties essential to the applicability of a term, are only those which we thus *insert* in our criterion. They are "essential" only because, and only in the sense that, we have *decided to use them* henceforth as part of our criterion.

V

Book II presents an analysis of empirical knowledge. Lewis there distinguishes three kinds of statements: "expressive" statements, and statements formulating respectively "terminating" and "non-terminating" judgments.

Expressive statements are those formulating "a directly presented or presentable content of experience" (p. 179), i.e., simply an appearance itself, such as it happens to be. What expressive statements formulate is completely certain, even if often difficult to formulate adequately. Lewis, however, denies it the name of knowledge, which he reserves for "that with respect to which some misapprehension could occur" (pp. 30, 183), thereby, we may note, disregarding the fact that, in existing usage, "knowledge" is opposed not always to "error" but often instead to "ignorance" (as, for instance, when a man is said to have known sorrow).

Terminating judgments are judgments that, given "a directly apprehensible presentation of a recognizable sort, a certain directly recognizable act would lead to a particular and directly recognizable result" (p. 179). Since terminating judgments concern only appearances simply, such judgments admit of "decisive and complete verification or falsification" (p. 181). They are of the form: Given that I have direct experience of kind S, then if I act in a directly apprehended manner of kind A, I shall have a direct experience of kind E.

Lewis argues, elaborately and ingeniously, that the "if" clause of a terminating judgment must be an act, but the most his argument seems to me to prove is that an act, antecedent to the direct experience the judgment predicts, can always alter somewhat the *value* that experience will have when it comes. On the other hand, it seems to me that the *nature*, as distinguished from the value of the direct experience predicted may be determined by an antecedent experience that is not an act. A friend of mine, for example, is so constituted that if he sees wavy lines, he experiences nausea. We must say also, I believe, not that the "if" clause of a terminating judgment has to be an act, but only that, unless it is an act, the terminating judgment has no *practical* value — cannot be put to use. The stress Lewis lays upon acts and activity is typical of the radically pragmatic standpoint he adopts throughout — saying, for instance, that "the primary and pervasive significance of knowledge lies in its guidance of action: knowing is for the sake of doing" (p. 3) and, in Book III, that a life imbued with concern to

be good on the whole "must be preponderantly active"; and that "the more characteristic and pervasive goods of it will hardly be those of passive enjoyment or those which are merely contemplative and... require some suspension of the active attitude" (p. 483). Lewis, it seems to me, greatly underestimates the philomathic and the aesthetic interests and their values. That, conceivably, all knowledge has practical bearings of some sort does not entail that it need always be sought for the sake of them. In particular, for persons engrossed in scholarly and scientific research, knowing is not typically for the sake of doing. Rather, doing is for the sake of knowing. And for the lover of music or poetry, feeling is not for the sake of the drive it may provide to action, but for its own sake. The goad of a threatening environment, rather than inherent pre-eminence of practicality in the nature of man, is what gives to the values of action such primacy as they have. Their primacy decreases in proportion to any recession of that threat — whether because of control over the environment or because of its happening to be friendly.

Nonterminating judgments are those concerning objects and their properties. Lewis calls them nonterminating because "while there is nothing in the import of such objective statements which is intrinsically unverifiable, and hence nothing included in them which is not expressible by some terminating judgment, nevertheless no limited set of particular predictions of empirical eventualities can completely exhaust the significance of such an objective statement" (p. 184). This entails that, although an objective statement is sometimes practically certain, it is theoretically never more than probable.

Lewis, I believe, is right insofar as he contends that whatever we know about objects or objective events, we came to know it somehow *through* our directly presented experience.[6] And, as regards the nonterminating character of the verification of an empirical judgment, (e.g., that this is paper,) that character would seem to remain even if one were to urge that one's meaning of, e.g., "paper," comprises only a finite number of properties; for the verification of even one of them is nonterminating, as involving reference to objects and objective events again, whose verification in turn is called for, and so on.

Nevertheless, it does not seem to me true that a statement of objective empirical fact is, *without remainder,* "translatable into some set of predictive statements each of which formulates some possible confirmation in direct experience" (p. 190). Most, if not all, of what

[6] Cf. G. E. Moore, *Philosophical Studies,* pp. 185–190.

Lewis says about the verification of objective statements seems to concern verification of the *nature* of some object, e.g., that it is really paper. But I do not believe that anywhere in these lectures he defines what it is to be an *object* or an *objective* event. I recall only passages seeming to suggest that he conceives objectivity essentially in terms of community or of regularity of direct experiences (e.g., pp. 226, 420).

But common sense would say, and, I believe, rightly, that the objective world is not such because, i.e., simply in the sense that, our judgments of it agree with one another; but on the contrary that the judgments we call objective agree because they are determined by something that is objective at least in the sense of causative of our sensations. Vague and defective in many respects as is the common-sense notion of what it is to be an "object," that notion includes, and, I think, validly, that an object is something which exists, and in and about which events occur, *even when none of us perceives it or them*; and that some of those postulated events, e.g., molecular motions, the emission of photons, the absorption of infrared rays, etc., are what cause our sensations. We do, indeed, often "perceive" the existence of objects, but to perceive it is to interpret automatically our sensations as having some cause, which is not itself an event in our direct experience and is therefore only postulated. Also, we "perceive" the nature of the objects whose existence we perceive, but their nature consists of *capacities*, evidenced by the occurrence of our sensations, to cause in us such and such sensations; and of capacities, in objects so perceived, to cause *in one another*, and whether or not we happen to perceive them, changes of various sorts.

The postulated unobserved causes for our sensations — postulated automatically in our animal faith that our sensations too have a cause though we directly experience none — are the "remainder" referred to above, which Lewis' discussion of objective knowledge seems to me to overlook; as, for instance, when he says that "there is no significance in objective belief nor in any statement of objective fact beyond what is expressible in terms of some theoretically possible confirmation of it" (p. 229). Any confirmation of it is such only under that postulate. Incidentally, what Lewis means here by "theoretically possible" needed to be explained, for, presumably, he would, for instance, rule out the defining of confirmation of statements about the past in terms of a test specifying the employment of a time-reversing machine. But in just what sense is this not a "theoretically possible" test?

In his ninth chapter, Lewis makes and emphasizes a useful distinction between the *justification* we have for a belief, viz., the grounds

we have at a given time for it, and its *verifications*, viz., the predictions for which *it* would be a ground, and the eventuation or non-eventuation of which would confirm or disconfirm it. He observes that among theories of truth, rationalist theories have emphasized the *grounds* of belief, whereas some pragmatic theories have emphasized the *confirmation* of belief (pp. 258–259).

That the ground of empirical belief is past experience brings up the question of the validity of memory, to which he turns after a penetrating chapter on probability. Some of our memories are deceptive, hence the most we can assume is that "the fact of present memory affords *some presumption* of the fact which is memorially presented." This, however, is needed and, together with "congruence," is as much as we need (p. 354). "Congruence" itself he defines by saying that a set of statements, or of supposed facts asserted, "will be said to be congruent if and only if they are so related that the antecedent probability of any one of them will be increased if the remainder of the set can be assumed as given premises" (p. 338).

The assumption that "the mnemically presented [is] a probability index of the future" is justified because it is "indispensable to our having any criterion of the empirically real" (p. 362). "To doubt our sense of past experience as founded in actuality would be to lose any criterion by which either the doubt itself or what is doubted could be corroborated" (p. 358). That empirical reality can be known "is an analytic statement which can only be repudiated on premises which already imply it" (p. 361). This the skeptic overlooks.

VI

The general thesis of Book III, entitled "Valuation," is that evaluations are a form of empirical knowledge not fundamentally different in respect to its confirmability or disconfirmability, nor in respect to the nature of its antecedent grounds, from other kinds of empirical knowledge (p. 365). One noteworthy contribution of the third book is the clear-cut terminology for the discussion of evaluations its first chapter lays down. It is felicitous as providing all the necessary distinctions while staying close to the well-established ordinary usages of words. A somewhat unfortunate choice in this respect, however, is that of the term "utility" to mean what "instrumentality" instead would have said exactly, since by "utility" Lewis means instrumentality simply, as distinguished from instrumental *value*.

To be noted is Lewis' use of the term "sensible." An action, or its

"intent" (i.e., its expected result), or its "purpose" (i.e., the part of its intent for the sake of which it is adopted), is *sensible* "if and only if something to which comparative value is ascribed is expected to be realized as a result of it" (p. 366).

Statements of value, like others, are of the three kinds distinguished at the outset of Book II. Expressive value statements formulate "direct findings of value quality in what is presented." These are not judgments. Besides them, there are also terminating value judgments and judgments of objective value. The latter are nonterminating. Values "can be realized or contemplated only as characters of something.... It is...impossible to intend or expect just 'value' or 'value in general'" (p.369). Therefore, in any sensible intent or purpose two aspects are distinguishable: (a) expectation of some result other than value, and (b) ascription of comparative value to this anticipated result.

The common error that judgments of value are not a form of knowledge is due, Lewis believes, to confusion as to three questions: (a) that of the nature of ultimate or basic value; (b) the question as to whether the value ascribed in a given value-ascription is self-regarding or community-regarding, and the desire so to "define the goodness of all kinds of goods...as to secure the point that nothing can be a genuine 'objective' good which is to be attained through immoral action" (p. 373); and (c) the question as to whether or why value-possession by others "legitimately lays claim to respect on one's own decisions of action" (p. 373).

Concerning the first of these questions, Lewis holds that a declaration as to the nature of the good (e.g., that it is pleasure, or that it is self-realization, etc.) is not an empirical statement but is analytic; and therefore either false or true a priori. It seems to me, however, that this is true only if the term "analytic" is interpreted in a sense which would permit one to say also that the kinetic theory of the nature of heat represents an "analysis" of what one means by "heat." It is an analysis not of the idea or criterion brought to mind by the word "heat," but of the meaning which it appears *necessary to ascribe* to the word "heat," to account for the laws of all the facts and phenomena to which we apply the word. Whether such construction of explanatory theory is best called analysis is open to question. In the case of a theory as to the nature of the good, it seems to me that if it is analysis of the meaning of the term, it is so only in a similar sense: it is *devising* for the word "good" a meaning that would account for the manner in which we actually use it in given phrases. These phrases would to-

gether constitute what might be called the "linguistic extension" of the term; and it is *they* which are the data to be fitted by any theory as to the meaning of "good," *not* the connotation in our minds this word happens to have. The process is not analysis of the abstract idea aroused in our minds by the word "good," unless in the elliptical sense that that idea determines our use of it in those phrases. But the fact would rather seem to be that we *learned the phrases first* and formed the idea, such as it is, by automatic induction from the nature of the contexts in which we heard them uttered. I am more certain that the object on which I am now writing *is called* "paper" than I am that it *is* paper in the sense of conforming to some concept of the nature of paper.

The type of definition of value Lewis sets forth "brings it home in the end to a quality directly disclosed or disclosable in experience" (p. 398). Apprehensions of it are "prizings" and are infallible; whereas "appraisals" are judgments that something is contributory to realization of what is "prized" and are fallible. To call that quality pleasure–displeasure, or pleasantness–unpleasantness, is likely to be misleading. Likableness, wantedness (and their opposites) describe better "that mode or aspect of the given or the contemplated to which desire and aversion are addressed; and...that by apprehension of which the inclination to action is normally elicited" (p. 403).

Lewis deals, effectively I think, with the objection that this makes value "subjective" in the sense of illusory or deceptive. A datum is in this connection defined as objective if it has "the character of a normal and common human apprehension in the presence of the object in question"; whereas "subjective" data are those "which deviate from this by reason of something which is a personal or temporary characteristic of the individual subject" (p. 423). Subjectivity in this sense, when known, is generally corrected for and then does not lead to mistaken objective judgments (p. 421).

I pass over without comment two chapters on aesthetic value and aesthetic judgment, which seem to me mostly sound *if* "objectivity" of aesthetic value is conceived in the manner just described. The penultimate chapter, on the moral sense and contributory values, argues that *a life good on the whole* is our ultimate rational concern. "Rational" here means "sensible" as previously defined. The imperative of rationality in this sense "*requires no reason*; being itself the expression of that which is the root of all reason" (p. 481). "A life good on the whole...can be contemplated only by some imaginative or synthetic envisagement of its on-the-whole-quality" (p. 483). It is a *gestalt*, and imagining it requires discernment of the various ways in

which the value of an experience may be "contributory" to that of another, i.e., enhance it or the reverse. Lewis describes them with much ingenuity.

As to this, it seems to me that to use one's imaginative synthesis of such a *gestalt* as criterion of the ultimate value of given experiences is hardly possible. At least, I personally would have to testify that, even with regard to my life up to date, I should be at a loss to say whether or not it was "good-on-the-whole." The question seems so artificial as to have hardly any meaning for me.

Section 4 of the chapter is devoted to what seems to me a definitive critique of Bentham's idea of a calculus of values.

The final chapter deals with values in objects and clarifies a number of important issues. It emphasizes that theory of values is not ethics: "questions of evaluation and those of ethics must be distinguished rather than identified." Value determinations, though necessary for ethics, "are not sufficient by themselves for any solution of ethical problems, in general or in particular. Questions of values....are empirical....But what is right and what is just, can never be determined by empirical facts alone" (p. 554).

In conclusion, I wish to reiterate that, nothwithstanding the many criticisms I have offered, Lewis' book seems to me one of outstanding importance and merit. I can conceive of no more valuable experience for anyone seriously concerned with basic philosophical problems than that of making a careful, detailed, and critical study of it. The book is noteworthy evidence of the service to philosophy rendered by the Carus Lectureship.

C. J. DUCASSE

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REVIEWS OF BOOKS

THE WORKS OF THE MIND. By MORTIMER J. ADLER, HEINRICH BRÜNING, MARC CHAGALL, S. CHANDRASEKHAR, ALFEO FAGGI, J. W. FULBRIGHT, ROBERT M. HUTCHINS, C. H. MCILWAIN, JOHN VON NEUMANN, ARNOLD SCHOENBERG, YVES R. SIMON, FRANK LLOYD WRIGHT. Edited for the Committee on Social Thought by ROBERT H. HEYWOOD, with a Preface by JOHN U. NEF. Chicago, University of Chicago Press, 1947. Pp. xi, 246.

This volume includes twelve lectures delivered at the University of Chicago in 1946 under the auspices of the Committee on Social Thought of which Professor John U. Nef is chairman. Professor Nef has written a preface for the volume. He explains that the purpose of the series was to bring before the audience "a number of distinguished men, who have made a mark in the life of our time through the works of their minds" and to have them discuss "the creative processes by which serious results might be achieved in the arts, in the conduct of educational and political enterprise, in creative thought and scholarship." Following an introductory lecture by Professor Yves R. Simon, of the University of Notre Dame, on "The Concept of Work," the book falls into three parts: on the arts, on action, and on scholarship. In the first there are four lectures: on painting by Marc Chagall, on sculpture by Alfeo Faggi, on architecture by Frank Lloyd Wright, and on music by Arnold Schoenberg. In the second are three lectures: on statesmanship by Heinrich Brüning, on legislation by Senator J. W. Fulbright, and on administration by Chancellor Hutchins. In the last there are four lectures: on science by Professor Chandrasekhar, on mathematics by John von Neumann, on history by Professor C. H. McIlwain, and on philosophy by Professor Mortimer J. Adler.

It is apparent that the contributors were asked to write out of their own experience in their several fields of activity, in short, to tell how their "minds" operated to produce the "works" for which they are notable. It is apparent also that they have tried conscientiously to fulfill this assignment. The results are interestingly different. The artists are in the main autobiographical, in a rather personal sense of the word. It is obvious, as Mr. Chagall says, that "there are many things in the realm of art for which it is very hard to find the key words," and that for the graphic artist at least the doors open for the most part "without

vain words." Accordingly they tell of their personal experience, or of the techniques that have seemed to them significant and that have helped them to form their own manner of expression, or they fall back frankly upon illustration rather than exposition, as Mr. Schoenberg does, asserting that "a real composer writes music for no other reason than that it pleases him." The upshot seems to be that little is gained by trying to verbalize what is not verbal, though the rules imposed by other universes of symbolism (like counterpoint, for example) are quite as rigorous, or intellectual if that is the word, as those of verbal discourse. The men of action, while only a little less autobiographical than the artists, are curiously apologetic, which is interesting in a world that is supposed to belong peculiarly to men of action. Dr. Brüning is concerned to show that the Reichskanzler in 1930 to 1932 had singularly little freedom of action. Senator Fulbright, while he upholds the intrinsic importance of the representative branch of our government, concedes that its present organization is antiquated and that Congressmen are not really much different from average Americans. Chancellor Hutchins is frankly pessimistic about the achievements and prospects of the university administrator, which is perhaps understandable since his archetype is Plato's philosopher-king. The scientists are neither pessimistic nor autobiographical. For them their subjects develop according to quite objective standards and to the solution of quite impersonal problems which are in no way dependent upon their private experience. One feels that they know what they want to do and are pretty confident of their ability to do it.

The book, one may assume, is constructed according to a plan: it begins and ends with a philosophical lecture, and one gathers that philosophy is supposed to supply the meaning of all the other "works of the mind." Professor Adler assumes some such task: "Philosophy thus introduces order into the whole intellectual enterprise, setting limits to each type of inquiry and establishing a division of labor." It can hardly be said that the result bears out the claim. There is no very perceptible relationship, for example, between what Professor Adler says about history and what Professor McIlwain says in his lecture on the subject, nor between what Professor Adler says about mathematics and what Professor von Neumann does in his lecture. For my own part I must confess a very considerable skepticism about a project to map the "mind" and to assign in advance to "each fundamental discipline" its "proper task." Such a venture had an initial plausibility when Aristotle tried it, but even then the results were not always happy, as when he decided that arithmetic and geometry are different fundamental disciplines—and Aristotle was not "incompetent to solve the specialized problems" of most of the sciences of his day, as philosophy is now conceded to be. Indeed, Professor Adler's conception of

philosophy seems to me in the last degree puzzling. The scientist "cannot tell us what matter is, or energy," because "his inquiry does not extend to the nature of things, or to their causes." Only the philosopher "by establishing real definitions...can grasp the nature of things as they are." To accomplish this rather stupendous task of definition, analysis, and demonstration he has no technique except dialectical conversation, and in his conversation he "must eschew the expression of opinion altogether." Unless he can express judgments, self-evident or demonstrated, "it would be better that he keep his silence." It seems as if philosophical conversation would be singularly disconcerting to the interlocutors. The outcome, however, at least for the present, is to be a *summa dialectica*, embodying the "whole tradition of European learning," but which need not be universally acceptable or even free from contradiction. Just how contradictions could get in unless some of the compilers sometime said something that was less than self-evident or demonstrated is hard to understand.

The book is interesting and worth while because of the unquestionable earnestness and sincerity with which most of the contributors tried to do the very difficult task assigned to them, viz., to tell what their work is like and how they do it. In many cases, and especially with the artists, the task was literally impossible. Even so the effort may convey an impression to the layman at least of the difficulty of any serious creative or constructive work.

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ARISTOTLE'S CRITICISM OF PLATO AND THE ACADEMY. Volume I. By HAROLD CHERNISS. Baltimore, The Johns Hopkins Press, 1944. Pp. xxvi, 610.

The two volumes of which the first is now in our hands are a sequel to Professor Cherniss' earlier book *Aristotle's Criticism of Presocratic Philosophy*, which appeared in 1935. The aim and method of the present work are fundamentally the same as those of the earlier study. By a careful interpretation and critical scrutiny of all relevant passages Cherniss seeks to form an opinion about the trustworthiness of Aristotle's reports and the validity of his critical strictures. Since Aristotle has a habit of studying Plato's views in conjunction and comparison with those of some of his immediate pupils—men like Speusippus, Xenocrates, and, perhaps, Heraclides Ponticus—Cherniss has wisely decided not to separate what Aristotle himself combines. This decision involves of necessity many attempts to identify the unnamed targets of Aristotle's attacks—attempts which are in turn predicated on the

reconstruction of their doctrines from fragmentary and not always reliable evidence.

Naturally enough, Aristotle's critical discussions of the Academic theory of Ideas claim much more space than any other phase of his criticism; the various aspects of this theory and Aristotle's struggle with the arguments, definitions, and specifications put forward by the Platonists in defense or elaboration of the doctrine form the bulk of the work. Intricate problems connected with the mode of existence of the Ideas, with their causal function, and their relation to the particulars find very full treatment. Yet the present volume also embodies the reactions of Aristotle to basic concepts of Plato's physics and cosmology, to Plato's definition and theory of Soul, and to the Academic method of dihaeresis and its excessive claims, to say nothing of numerous smaller subjects whose treatment is incidental to the discussion of the larger complexes. Cherniss examines passage after passage, and every passage thus analyzed has a function in his argument. The analyses are worked out with extreme care; nothing that ancient or modern learning might contribute to the clarification of the problems is left unused. The learning and acumen applied to these interpretations secure them a value far transcending their immediate purpose.

The results parallel those at which Cherniss arrived in his book on the Presocratics. Aristotle is again found to misunderstand and misrepresent the meaning of the doctrines which he reports, and his criticisms, since they are based on such misunderstanding, do not touch the core of the doctrines. Again and again when inquiring into the mode of being which appertains to the Ideas Aristotle substitutes his own concept of particularized and individualized being for the Platonic notion of Being. He confuses the "separation" of Ideas (from particulars) with the separate existence of particular entities. He thinks in terms of his own "matter" and his own "contraries" when discussing Platonic conceptions to which these notions are not germane. He also seems to misunderstand the Platonic absolute, *καθ'αὐτό*, which is the opposite of the relative (i.e., relative to the Ideas, dependent) existence of particular things, but not in the same sense the opposite of relations, for terms of relation are *καθ'αὐτό* too for Plato; and he may be guilty of misinterpreting Plato's concept of "nature" (*φύσις*) when he insists that Plato's declaration that there are Ideas of everything that is "by nature" excludes Ideas of artifacts. (On this subject I hesitate to commit myself completely to Cherniss' point of view, for he seems to overstress the importance of certain Platonic arguments in which "craft" [*τέχνη*] is treated as an ingredient of the new concept of Nature.) In dealing with Plato's conception of Soul as the self-moving principle and originator of movements Aristotle shows himself incapable of grasping Plato's real meaning, and there are even in-

stances, e.g., the problem of weight, in which Aristotle instead of considering Plato's actual theory constructs a "Platonic doctrine" from what is probably not even a hint of one and then proceeds to attack it.

It is impossible to convey an adequate impression of the amazing intellectual energy which Cherniss has put into his analysis of Aristotle's arguments. With inexorable logic he points out how and why a particular misunderstanding vitiates a complex train of thought, and he shows that Aristotle's statements have implications of which he himself was unaware. In a characteristic sentence (p. 369) he criticizes Aristotle for "refusing to press the analysis to its logical conclusion." As a matter of fact, Cherniss himself in a good number of instances presses to conclusions which are not warranted in the context, and he also presses the interpretation of what Aristotle actually says to a point where his findings can no longer be substantiated by the text.

A section of *De coelo* (304 a7-b11) is by Cherniss called "uncommonly instructive for the way in which Aristotle 'reinterprets' the statements of other thinkers that by criticism of the doctrines so interpreted he may construct the foundations of his own system" (p. 145). Although both Plato and Xenocrates had posited the usual four elements —earth, water, air, fire—Aristotle treats them as if they had recognized fire as the basic element, because by refuting their theory that fire has the geometrical shape of a pyramid "he can neatly show that the element can have no figure at all.... Then by refuting Heraclitus who assigns no figure to fire he shows that the element cannot be single." Actually Aristotle does not try to kill so many birds at once. As he thinks that fire could better than anything else serve as the single element he shows that it could not be upheld as an indivisible entity, and that as soon as it is considered divisible it ceases, both on the Platonists' and on Heraclitus' assumptions, to be an element.

In a passage of the *Metaphysics* (1087 a10-25) Aristotle argues that knowledge of the universal is a potency, knowledge of the particular the corresponding actuality, and that he who knows the particular knows "incidentally" at the same time the universal. This treatment of knowledge of the universal as a mere potency strikes Cherniss as unorthodox, and he considers himself entitled to read into this passage the doctrine of *De anima* according to which the subject of actual knowledge is the "form" (εἶδος), i.e., the dematerialized, Platonic form. Unfortunately the language and clear meaning of the passage in the *Metaphysics* make this interpretation quite impossible, so that it is idle to speculate what concept of the universal or of universality we get if we identify the "particular" of this passage with the "form" of *De anima*. Cherniss, however, constructs this concept, examines its im-

plications and, finding them unsatisfactory, burdens Aristotle with the responsibility for what is entirely the result of his own construction (pp. 338–351).

Aristotle's identification of Plato's "Non-Being" with his own "matter" is a mistake and a source of mistakes; so is his tendency to treat Plato's Being and Non-Being as contraries in the sense of his own doctrine. Yet Aristotle does not carry this approach to the length of suggesting that since the Ideas are one term of a contrariety they must—like any term in an Aristotelian pair of contraries—have a material substrate. The brief sentence (*Metaph.* 1075 b22-23: "contraries have a material substrate and are potentially") on which Cherniss bases his assertion refers to Aristotle's own first principle, the unmoved mover. The point is that this principle being pure actuality has no contrary (pp. 102 ff.).

Metaph. A5,987 a9-31 assesses the contributions of the Pythagoreans to the recognition of the "formal cause"; A6,987 b10 ff. discusses Plato's debt to the Pythagoreans in regard to his first principles, the One and the "Great and Small." Cherniss believes himself able to prove that both passages were absent in the first draft of this section, that originally Aristotle recognized no such contributions on the part of the Pythagoreans and did not connect Plato's doctrine with the Pythagoreans but gave Socrates more credit for the direction of Plato's thought. Thus there would have been no reference in the original draft to Plato's first principles or to the theory of Ideas-Numbers which is bound up with them. Now it is indeed possible that the former of the two passages is an afterthought, but this afterthought may have originated immediately after the completion of the first draft. Or it may have arisen some hours later when Aristotle pondered Plato's debt to the Pythagoreans. In any case, Cherniss' arguments though by no means negligible are not strong enough to support his far-reaching conclusions; it is certainly impossible to infer from the reference to Socrates at 1086 b2 that he must have played a larger part in the original version of A6 (pp. 189–198).

There are other instances in which one may take issue with Cherniss' interpretation, and there are many passages in which he is unduly severe on Aristotle. For even where Cherniss makes a valid point he does not always remember the very reasonable sentences which he wrote in his earlier book (p. 347): "There are no 'doxographical' accounts in the works of Aristotle because Aristotle was not a doxographer but a philosopher seeking to construct a complete and final philosophy" (it is not for the last four words that I quote this sentence, for if any of the great philosophers had no illusions about the finality of his philosophy it was Aristotle). "For him as for every philosopher the doctrines of his predecessors were materials to be remoulded for his

own purpose." If this is true it is certainly just as unwise and unhistorical to judge Aristotle's accounts by the standards of philological and historical accuracy which we have inherited from the nineteenth century as it is legitimate and necessary to examine them by these standards. Aristotle's system may be vulnerable and full of inconsistencies, yet Cherniss is mistaken if he thinks that sound and methodical interpretation if applied to Aristotle reveals all kinds of hidden flaws and if applied to Plato resolves even the most obvious discrepancies and contradictions and shows his philosophy to be immune against the attacks to which Aristotle is open. The reader cannot fail to see that the same art of interpretation if turned in a different direction could magnify the disagreement between statements in different Platonic dialogues—I do not suggest that this would be a worthier task—and if he does not share Cherniss' conviction that a closed and rather rigid system is a *conditio sine qua non* for a reputable philosopher he may not even be greatly perturbed by this realization. Conversely, I have little doubt that historical and philosophical understanding can arrive at an appraisal of Aristotle's "indwelling form" which would be considerably more sympathetic than the trenchant verdict which Cherniss passes on this concept (pp. 371 f., on the strength of a reasoning in which, though trying hard to think in Aristotelian categories, he has perhaps not rid himself completely of all Platonic connotations of "form"). Where the question of consistency arises Cherniss gives Plato always, Aristotle only sometimes, the benefit of the doubt.

The solid substance of the book is not impaired by these errors of judgment. The results which I have summarized at the beginning of this review are likely to stand the test. There are many splendid new interpretations. I doubt, for instance, whether it has ever before been pointed out that the reference at *Timaeus* 58A to the revolving circumference of the Cosmos establishes a causal connection between the World-Soul (which is responsible for this revolution) and the movements going on inside the Cosmos (pp. 449 ff.). Appendix X includes —side by side with a somewhat forced explanation of a passage in Cicero in which Cherniss unnecessarily finds Aristotle credited with two "divine movers"—some valuable clarifications of disputed points in Aristotle's theology. And again (pp. 206–213, 374 f.) the difference between what Plato meant the Ideas to be and what Aristotle understood him to mean is brought out with admirable clarity and incisive force. No Platonic or Aristotelian scholar can afford to neglect the book. In fact, it should be read, not only consulted, and it is perhaps all to the good that before Volume II appears the rich learning of these 610 pages will not be handily distilled in the form of an Index.

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COOPERATION IN GENERAL EDUCATION. A Final Report of the Executive Committee of the Cooperative Study in General Education. Washington, D. C., American Council on Education, 1947. Pp. xv, 240.

GENERAL EDUCATION IN THE HUMANITIES. By HAROLD BAKER DUNKEL. Washington, D. C., American Council on Education, 1947. Pp. xvii, 321.

These two books are part of a series of four volumes, the other two being *General Education in the Social Sciences* and *Student Personnel Services in General Education.* There is also a projected volume on general education in the sciences, which has not been published yet. More than twenty colleges of the utmost variety of types have co-operated in this study of general education. The investigation began in 1939 and ended in 1941. As the authors point out: "It is not too much to say that the Cooperative Study in General Education constituted the first systematic and cooperative attack upon the myriad problems connected with the development of this movement."

A staff has been organized which has served as a clearing house for information and plans, for the faculties of the colleges represented. While sharing their problems and solutions, they have respected the individuality of each participating college. Fellowships have enabled instructors to leave their work and study with the central group; statistical material has been gathered, and workshop and regional conferences have been organized; all in all, an investigation has been undertaken and completed whose results should be highly valuable not only for the colleges immediately concerned but for all the educational institutions in the country which are today wrestling with the problem of general education.

The problem goes deep into the heart of education itself. A prospective college teacher, preparing himself for the career of teaching by taking courses in a graduate school, is primarily concerned with mastering subject matter. His interest is in research (and one which is highly specialized at that); while he is in the graduate school he receives practically no direct equipment for teaching and indeed hardly thinks about the matter. He has been made familiar with facts and ideas, but once through, he has to deal with human beings and their needs. A young medical student has his eye on patients while in the medical school; it can hardly be said that the graduate student in philosophy has his eye on his future clients. Yet surely, in order to become a successful teacher, he should acquire some ideas, not so much on techniques of teaching, as on goals of education. As the present report emphasizes, it is important for us to become aware of our objectives as teachers and of the uses of the different subject matters:

to "will these objectives deliberately" and to "state them explicitly.... We believe a philosophy of education must be held by every person engaged in education....Unless educational practice rests on some coherent set of principles, it degenerates into mere activity." Surely philosophers will sympathize with this emphasis on a philosophical grasp of educational objectives; and surely if such grasp is valuable for nonphilosophers, it is at least as valuable for professing philosophers.

The authors of the study have avoided dogmatism and have refrained from trying to suggest a uniform set of objectives for every different type of college. But they have sought a common basis; they have proceeded judiciously and with open and reflective minds. How does one go about determining the goals of education? As a balancing force against personal and arbitrary predilections, the authors have queried the students on what they themselves think their needs are. They have taken careful polls of student opinion; the educational doctor has gone to the patient and has tried to co-operate with him in the diagnosis of the ailment. The authors however, have been aware that what is actually pursued is not necessarily what ought to be pursued. The proper list of aims has to be arrived at by a judicious weighing of the students' professed preferences against traditional goals on the one hand, and a conscious framework of philosophical ultimates on the other. But, I think, the authors have overemphasized polls of student opinion in proportion to the other factors, despite their intentions to the contrary.

The ideal of general education arises as a reaction against the prevalent specialism in the colleges. What is wanted is not the elimination of specialism but a combination of the latter with general education. The authors favor the inauguration of separate departments for this purpose. Here grave care should be exercised. We do not want a division of the two areas which might lead to mutual antagonisms. A teacher in general education ought to have an opportunity to carry on serious research and also to teach specialized courses. Each area must fertilize the other, else both might become barren. It is surely nobody's *deliberate* plan to interfere with the advancement of learning; yet if a large number of teachers in a department have to devote a major part of their time to general education, the level of specialized instruction will go down, and the quality of the teachers as rigorous and productive thinkers will be impaired. Hence the proper relationship of the two areas of education is a matter of the greatest importance and requires the application of wisdom and perspective.

As the authors point out, accommodations will have to be made on the side of graduate schools. A graduate student receives instruction in the narrowest of fields. When he goes out to teach, then, if his field

be history, it will not include any other field. And if he is in the field of American history, then he will disqualify himself for the teaching of European history. The introduction of courses in general education is bound to bring about some fairly radical changes in the organization of graduate teaching.

This reviewer would like to raise two points: the place of courses in Christianity and the place of courses in philosophy, in the scheme of general education. (a) The problem of religious instruction did not offer special difficulties for the members of this co-operative group, since some of the colleges are denominational, and many of them regard religion as a normal part of the curriculum. But in many of the colleges on the Eastern seaboard and in many of the larger universities, the problem is ignored rather than solved. The history of the matter is clear. When the educational institutions became secularized, religious instruction was abandoned. It was held, and rightly so, that the function of the teacher was to teach and not to preach; that a university must consider the subject matter objectively and must not on any account indoctrinate. I do not dissent from all this; but I wish to point out that the action is wholly negative. A new problem has been created, with little or no attempt to bring about a positive solution. In the old-fashioned times, the student obtained his values through the medium of religion. Now that religious instruction has been removed from the scene, a dangerous vacuum has been created. A student is eager to obtain an adequate idea of values for his life, and if intelligent instruction will not provide them, he is liable to listen to false prophets and fanatics. The Harvard Report was evasive on this matter, or rather it suggested that education in values be imparted through the study of literature. We know that this was how the Athenians obtained their values, and we know what Plato thought of the system. His criticism of the poets was primarily addressed to them in their capacity as teachers of ideals. Plato was convinced that the poets were confused and wrong, and that literature is too indeterminate to offer a definite direction to the young mind.

I suggest that courses in Christian philosophy should be made part of the curriculum of general education, on the following ground. A student must learn the sources and premises of his civilization; and these are (roughly speaking) Hellenism, Christianity, science, and democracy. He is getting instruction in the two last; so he should in Christianity. Such a course will aim to present and not to indoctrinate, but it may well be sympathetic, just as instruction in our democratic tradition is sympathetic. Moreover, it should be noted that a student in science is not simply being taught facts; he is acquiring the scientific mentality and the scientific outlook. He is unconsciously imbibing a philosophy of nature, and imbibing it by quasi-indoctrination. I do not

see why anything else should be done for Christian philosophy; at any rate I am only asking that the student be introduced, in a scholarly fashion and with a sympathetic attitude, to the Christian premises of Western culture.

(b) Our authors are keenly aware of the importance of philosophy in any scheme of general education. The danger here arises from the opposite direction. The embrace of philosophy by general education may become the bear's hug that kills. The tendency now is to infuse philosophy as a ferment in all the various areas and to have no particular course in philosophy at all. The argument has its cogency. The authors say: "Logical thought, the ways of obtaining knowledge, the nature and basis of value-judgments, and similar problems should not be the concern of the department of philosophy alone. The problems of evidence and proof arise in all fields; the problems of knowledge are most real and vital in regard to the sciences and arts."

This is fine; but its logical conclusion may well be that everybody from every area may teach philosophy, except the professional philosopher—presumably the person most competent to teach the subject. But is the presumption so evidently false? Philosophers must engage in some unpleasant soul-searching on this matter. Nonphilosophers in the faculties have been heard to say: "*We* are specialists and we need the philosophers to give us the synthesis which we so sorely need. But we find to our chagrin that *you* philosophers too have become specialists; you are just another department." Is there no truth in this complaint? Especially when the number of graduate students is large, a department of philosophy is apt to emphasize rigor at the expense of concreteness, to stress the core of philosophy to the exclusion of interconnections with other areas. Every department of philosophy must ask of itself the question whether it is contributing its share to the education of the general student. This is not a plea for sloppiness of thinking and for vagueness; it is a plea that we should combine rigor with concreteness, develop both the core of philosophy and its relationship with the larger concerns of living. But as things are, we are not justified in expecting that departments of general education will call upon us to participate in the work of general education, so long as we go on ignoring the larger relevances of philosophy. And here, even those of us who disagree with John Dewey's technical philosophical position, must admit that his influence on the teaching of philosophy has been good to the extent that he has succeeded in breaking down the isolationist philosophy of departments of philosophy.

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LA PERSONNE INCARNEE. Etude sur la phénoménologie et la philosophie existentialiste. By AUGUSTE BRUNNER. Paris, Beauchesne et ses fils, 1947. Pp. 300.

Attempting to find the true basis for and the limits of the phenomenological method the author of this learned and often penetrating study first of all gives a brief account of the origins of the phenomenological movement, then subjects Husserl's own use and interpretation of it to a thorough and critical examination, finally, after an intervening discussion of the connections between phenomenology and existentialism, ends with an exposition of his own views of God and man and the relations between them.

Brunner's criticism of Husserl may, in the main, be summarized in the well-documented assertion that most, if not all, of the perplexities that confronted him, and the major weaknesses of his philosophy as a whole, should be attributed to his basic epistemological idealism rather than to phenomenology as such, which, as Brunner clearly recognizes, is equally, if not even better, compatible with a more realistic attitude toward the world and the objects of our knowledge. To this reviewer, at least, the most interesting and worth-while pages in this work are indeed to be found in the author's examination of Husserl's attempts to justify our belief in the independent reality of our fellow men—attempts which, because of the unsoundness of his epistemological presuppositions, from the start were foredoomed to failure, despite Husserl's persistent attempts to reach a satisfactory conclusion. The high-water mark of the entire discussion is perhaps to be found in pp. 75–76 and, especially, pp. 85–86, where Brunner stresses the impossibility of our inferring the meaning of the bodily changes, such as facial movements, in others from the observation of such movements in ourselves and the consequent necessity of ascribing an opposite direction to the interpretative process.

Regarding intuition as the source and end of knowledge alike, Brunner maintains—correctly as I think—that this is both a spiritual and sensuous but not a creative activity, which finds or discovers, but does not fashion, its objects, and that Husserl's failure to realize this drove him to a practical solipsism regardless of his numerous affirmations of the existence of other subjects. Brunner adds that this fact also, presumably, explains Husserl's failure to discuss the possibility and origins of error.

Admitting that there is a valid distinction between things-in-themselves and appearances, Brunner thinks that Husserl, no less than Kant, misinterpreted the differences between them, their conception of knowledge preventing them from recognizing that phenomena may be either objects of consciousness, independently or antecedently exist-

ing, or mere objects of consciousness whose essence is their being perceived.

Deeply conscious of the fact that the phenomenological movement is interpreted in a very different fashion by different philosophers who, in one way or another and to diverse extents, have been influenced by Husserl, Brunner does not, of course commit the error of assuming that his strictures on Husserl are equally applicable to philosophers so diverse in themselves as say, Scheler or Hartmann.

Trying to account for the form Husserl gave his own phenomenology, Brunner suggests that the basic motives for this are to be found not so much in purely philosophical considerations as in Husserl's desire to find a religion, or a substitute for one, in the deification of humanity, and more particularly of the human reason—a suggestion not without a certain plausibility. Over against all such attempts to find a basis for hope and strength for achievement in abstract, purely ideal entities, Brunner maintains, and again I find myself in complete agreement, that the power of any ideal must be derived from the actual existents it inspires, that only the real may give birth to anything real, and that it is the failure to recognize the full import of this that is at the basis of diverse inadequate philosophies, of which existentialism is only one.

The failure of Husserl and the existentialists alike to comprehend the nature either of man or of God, or the relationship between these is thus, according to Brunner, largely traceable to their epistemological idealism—a view often expressed in the past with equal or even greater forcefulness by writers as diverse as Schweitzer and Archbishop Temple, not to mention others.

To understand man, Brunner maintains, we must always remember that he is an incarnate spirit, a being at one and the same time living and personal, whose body occupies a position somewhere between the subjectivity of spirit and the objectivity of mere matter. The differences between man as a personal subject and man as a living one are, he points out, recognized even in the grammars of diverse languages: *I* pointing to the former and *me* to the latter.

The latter part of the work is devoted to an exposition of the twofold nature of man and its various implications, a subject, as Brunner points out, difficult to delineate properly as man is free to center his personality either in the personal or in the vital, or biological, sphere, since by rights he is at home in both. Brunner insists, however, that one fact is indubitable, namely, that man neither is nor can be a completely isolated creature, but one whose manner of life, even his mere being, is intrinsically and inseparably bound up with those of his fellows, whose lives constantly influence his as they, for their part, are being influenced by him. Every basic experience, including those of self-consciousness and our awareness of others, is thus a shared one at all stages of our being.

Our neighbors are thus no mere objects, but subjects recognized as such, akin to ourselves. There is no sharp break between the personal and the communal, in fact, personality implies community, if not communion. Man cannot, consequently, realize his essential self, or his full potentialities, without loving and being loved, since it is in love that the community of spirits, or persons, is made most evident. (From the viewpoint of logic such an argument is, of course, open to serious criticism, as Rasdall's criticism of self-realizationism, in *The Theory of God and Evil*, showed long ago.) But Brunner does not believe that man can discern this, or in any case that he cannot do so with sufficient clarity, without the aid of a supernaturally revealed faith mediated by other men. A good life requires a religious basis, and of all religions Christianity is the highest because it is centered in an incarnation which gives due weight both to the vital and the personal aspects of our being.

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INTUITION ET RELIGION. Le Problème existentialiste. By PAUL ORTEGAT. Louvain, Bibliothèque philosophique de Louvain, 1947. Pp. 248.

A study of the existentialist movement by a Jesuit philosopher, this work treats existentialism as the modern development of traditional philosophical intuitionism. For Ortegat, existentialism is no isolated and aberrant doctrine; rather it is a theory with roots deep in the tradition of French and Continental thought. In this tradition, existentialism is made to appear intelligible and intellectually respectable. But Ortegat regards the tradition itself as mistaken in its fundamental premises and emphasis.

Especially within the limits of religious philosophy, the analysis is admirable, and the criticism is acute. Ortegat appreciates many of the features of existentialism, for example, the existentialist treatment of love. But he is too concerned with the religious deficiency of the doctrine as a whole to make any constructive use of what he takes to be its sounder elements.[1] He exposes the fundamental errors of the movement in their opposition to the fundamental truths of Catholic philosophy, and his discussion of Kierkegaard is a warning to neo-orthodox Protestants that existentialism also has fundamental errors in opposition to fundamental Protestant truths.

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[1] For a careful and constructive development by a Jesuit of the existentialist analyses of love, see *The Mind and the Heart of Love*, by M. C. D'Arcy (New York: Henry Holt & Company, 1947).

BASIC PROBLEMS OF PHILOSOPHY. Selected Readings with Introductions. By DANIEL J. BRONSTEIN, YERVANT H. KRIKORIAN, PHILIP P. WIENER. New York, Prentice-Hall, Inc., 1947. Pp. x, 752.

The subtitle of this volume indicates its structure. There are nine chapters, each with about nine pages of introduction followed by about seventy pages of readings. The readings are for the most part very suitable for an introductory course and are long enough to present their arguments intelligibly. The introductions, however, are so short as to be limited to biographical details and sketchy exposition. Accordingly the teacher will want to rely on himself for discussion of the questions raised and the manner of answering them. Professor Wiener has arranged the chapters on Ethics and Politics, choosing the readings from classical writers (Plato to Lenin with the addition of Dewey). For Philosophy of Science he has chosen from Poincaré, Peirce, Russell, and Reichenbach. Professor Bronstein provides for Methodology Plato's *Gorgias,* Bacon, Bergson, and Peirce. For Theory of Knowledge he offers Berkeley and Hume rebutted by passages from Santayana and F. J. E. Woodbridge. There is no mention of G. E. Moore or any of the younger English writers on this topic. Is his tongue in his cheek when in the face of his Deweyan collaborators Professor Bronstein says: "Is Woodbridge contending that there are no problems in epistemology worth studying, or is he suggesting a different approach to these problems?" (p. 361)? In the concluding chapter, by offering selections ranging from Maritain to Schlick, Professor Bronstein displays a charming refusal to take sides openly. Professor Krikorian's three chapters on Art, Religion, and Reality exhibit through his selections and systematic introductions his own views on emergent naturalism.

The volume has a tantalizing way of bringing before the reader the great philosophic issues of the past, promising solutions, and, with an injunction to employ "the scientific method" and gain "broad vision," concluding with "These questions are left to the reader" (p. 361). This is perhaps an unfair complaint to make, since this failure to carry out solutions in detail is characteristic of so much of American philosophy. It is, however, forty years since William James advised Schiller that what is needed is "to make applications to special problems. . . . Refutations of error should be left to the rationalists" *(Letters of William James,* II, 282).

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BOOKS RECEIVED

THE MEANING OF HUMAN HISTORY. The Paul Carus Lectures, Sixth Series, 1944. By MORRIS R. COHEN. La Salle, Illinois, Open Court Publishing Company, 1947. Pp. x, 304.—To be reviewed.

THE MORAL SENSE. Oxford Classical and Philosophical Monographs. By D. DAICHES RAPHAEL. New York, Oxford University Press (London, Geoffrey Cumberlege), 1947. Pp. viii, 201.—To be reviewed.

CIVILIZATION AND RELIGION. An Argument about Values in Human Life. The Rockwell Lectures on Religion at the Rice Institute, Houston, Texas. By CHARLES W. HENDEL. New Haven, Yale University Press, 1948. Pp. x, 78.—To be reviewed.

THOMAS JEFFERSON AMONG THE ARTS. An Essay in Early American Esthetics. By ELEANOR DAVIDSON BERMAN. New York, Philosophical Library, 1947. Pp. xviii, 305.—This interesting book brings together, probably for the first time, Jefferson's observations and views on the "fine arts," and on gardening, oratory, and letter writing. There are twenty illustrations, a bibliography, and an index.

KINGSHIP AND THE GODS. A Study of Ancient Near Eastern Religion as the Integration of Society and Nature. By HENRI FRANKFORT. Chicago, University of Chicago Press [1948]. Pp. xxv, 444.—The nature of the book is indicated by the subtitle. Kingship in the ancient pre-Greek world was not conceived as a political or a secular institution but as a link between human society and nature, and the king's function was to maintain this bond. The study is divided into two main parts, the first dealing with Egypt and the second with Mesopotamia. A short epilogue contrasts Jewish kingship with both. Between these two cultures the author finds a fundamental difference in the conception of kingship. In Egypt the king was a god; in Mesopotamia he was a human king dedicated by the gods to a special service. Corresponding to this difference of conception there were in the two cultures characteristically different ideas about the world, about the place of human society in it, and

about the nature of personality within society. The culture of Egypt was orderly and remarkably free from fear but static; that of Mesopotamia was more precarious and marked by a sense of anxiety, but it permitted a wider variability. In both cases the concepts of nature and the gods, and also the religious rites and festivals, were correlated with important differences between the seasonal cycles in the Nile Valley and in the Mesopotamian plains. The author makes use of a wide selection of archaeological data, and the book is beautifully illustrated. He uses also literary texts, religious formulas and rites, and the procedures of coronation, of funerary ceremonies, and of festivals. The book may be said to document the volume of lectures published by the University of Chicago Press in 1946 entitled *The Intellectual Adventure of Ancient Man.*

MASTERS OF POLITICAL THOUGHT. Volume II: *Machiavelli to Bentham.* By W. T. JONES. Boston, Houghton Mifflin Company, 1947. Pp. 388.—The second of three volumes. The first covered the subject from Plato to Machiavelli and was written by Michael B. Foster; the third, from Bentham to the present, by William M McGovern, is in preparation. The whole work was planned under the editorship of the late Edward McChesney Sait. It originated in dissatisfaction with the teaching of political theory from a textbook only. The plan of the three volumes contemplates copious quotations from a relatively small number of important thinkers, woven together by only enough comment to make a connected exposition. The authors selected for treatment in this volume are Machiavelli, Bodin, Hobbes, Locke, Montesquieu, Rosseau, Burke, and Bentham. The selection of passages for quotation is judicious, and the connecting passages are as unobtrusive as Professor Sait intended. Obviously, the plan of the work will meet criticism from teachers who prefer that a student should see the whole of *The Prince* or the *Second Treatise* as they were written, or who doubt whether an excerpter can make the *Leviathan* clearer by arranging the chapters in an order different from that which commended itself to Hobbes.

DREADFUL FREEDOM. A Critique of Existentialism. By MARJORIE GRENE. Chicago, University of Chicago Press, 1948. Pp. x, 140.—To be reviewed.

THE RELIGION OF THE MODERN SCIENTIST (NEO-MATERIALISM). By S. W. TROMP. Leiden (Netherlands), A. W. Sijthoff's Uitgeversmaatschappij N.V., 1947. Pp. xiv, 480.—A system of "neo-materialism" by a professor of geology at the Fouad I University of Cairo, Egypt.

"I." A Basic Work for All Treatises. By GNANA VALLAL PARANJOTHI MAHAN. Madras, Universal Peace Sanctuary, 1947. Pp. vi, 72.

BETWEEN MAN AND MAN. By MARTIN BUBER. Trans. by RONALD GREGOR SMITH. New York, The Macmillan Company, 1948. Pp. viii, 210.—To be reviewed.

PSYCHOLOGICAL ATLAS. By DAVID KATZ. New York, Philosophical Library, 1948. Pp. x, 142. With 400 illustrations.—A curious collection of diagrams and photographs illustrating various topics of psychological interest. This makes pleasant browsing, but it is hard to see what other purpose it can usefully serve.

RELIGION IN THE TWENTIETH CENTURY. Edited by VERGILIUS FERM. New York, The Philosophical Library, 1948. Pp. xx, 470.—To be reviewed.

THE HEATHENS. Primitive Man and His Religions. By WILLIAM HOWELLS. Garden City, New York, Doubleday & Company, Inc., 1948. Pp. xiv, 306.—A popular description of the major traits of primitive religions.

THE FUTURE OF THE AMERICAN JEW. By MORDECAI M. KAPLAN. New York, The Macmillan Company, 1948. Pp. xx, 571.

IDEAS HAVE CONSEQUENCES. By RICHARD M. WEAVER. Chicago, University of Chicago Press, 1948. Pp. vi, 190.—To be reviewed.

TWO TREATISES OF GOVERNMENT. The Hafner Library of Classics, II. By JOHN LOCKE. With a Supplement *Patriarcha* by ROBERT FILMER. Edited with an Introduction by THOMAS I. COOK. New York, Hafner Publishing Company, 1947. Pp. xlii, 311.—The second of the Hafner Library of Classics. It reprints Locke's two treatises and also Filmer's *Patriarcha*. There is an excellent introductory essay by Professor Cook.

LEIBNIZ. Il Congresso Internazionale di Filosofia (Roma, 1946). *Archivio di Filosofia*, Roma, Anno XVI, Vol. 1, 1947. Pp. 105.

DER ITALIENISCHE HUMANISMUS. Per EUGENIO GARIN. Bern, A. Francke Ag., 1947. Pp. 295.—To be reviewed.

MALEBRANCHE: CORRESPONDANCE AVEC J.-J. DORTOUS DE MAIRAN. Edition nouvelle précédée d'une Introduction sur *Malebranche et le Spinozisme*. Par JOSEPH MOREAU. Paris, J. Vrin, 1947. Pp. xii, 174.

ATTI DEL CONGRESSO INTERNAZIONALE DI FILOSOFIA PROMOSSO DALL'INSTITUTE DI STUDI FILOSOFICI, ROMA 15–20 NOVEMBRE 1946. I: Il materialismo storico. A cura di ENRICO CASTELLI. Milano, Castellani & C., 1947. Pp. lix, 453.—To be reviewed.

INTUITION ET RELIGION. Le Problème existentialiste. Par PAUL ORTEGAT. Louvain, Bibliothèque philosophique de Louvain, 1947. Pp. 248.—Reviewed in this issue.

ÜBER DIE GEGENSTANDSBEGRIFFE IN DER KRITIK DER REINEN VERNUNFT. Von HERMANN HINDERKS. Basel, Verlag Haus zum Falken, 1948. Pp. viii, 204.—To be reviewed.

EUROPÄISCHE PHILOSOPHIE DER GEGENWART. Von I. M. BOCHÉNSKI. Bern, A. Francke Ag., 1947. Pp. 304.—This handsome volume is a useful elementary survey of twentieth-century philosophy. The summary statements of philosophical positions would be of more value to someone seeking encyclopedic information than to a serious philosophical student. There are, however, useful bibliographies. The book is very well arranged.

MEMOIR OF THE NATURE OF THE CHURCH OF CHRIST. By A. MAKRAKIS. Trans. from the Second Edition by D. CUMMINGS. New York, Christian Brotherhoods Zealots of Orthodoxy and John the Baptist, 1947. Pp. 168, 16.

PROOFS OF THE AUTHENTICITY OF THE SEPTUAGINT. Chicago, Hellenic Christian Educational Society, 1947. Pp. 32.

LA RAGIONE POETICA. Per GAETANO CHIAVACCI. Firenze, G. C. Sansoni, 1947. Pp. xii, 364.

THREE ESSAYS BY KARL MARX SELECTED FROM THE ECONOMIC, PHILOSOPHICAL MANUSCRIPTS. Edited by J. R. JOHNSON, F. FOREST, and RIA STONE. Trans. by RIA STONE. New York, 1947. Pp. 44.

PSICANALISE E PSIQUIATRIA. Per J. ALVES GARCIA. Rio de Janeiro, 1947. Pp. 120.

NOTES

The Jerusalem Historical and Philosophical Society was organized March, 1946, to promote the study of history, philosophy, and literature in Palestine among British, Jewish, and Arab communities. The sole qualification for membership is serious interest in one of these subjects. Sir William Fitzgerald is president and Miss E. Cunnington is secretary-treasurer.

Following the withdrawal, for reasons of health, of G. H. Sabine, C. J. Ducasse of Brown University has been elected the eighth Carus Lecturer. The lectures will probably be delivered in the spring of 1949. His topic is "Nature, Mind and Death."

Professor Marten ten Hoor has requested us to state that the quotation in his article "The Role of the Philosopher" (LVI [September, 1947], 524) should have been ascribed to Wordsworth instead of to Meredith.

ARTICLES IN CURRENT PHILOSOPHICAL PERIODICALS

MIND LVII 225: Editorial Note; *John W. Yolton,* A Defence of Sense-Data; *E. J. Furlong,* Memory; *P. Nowell-Smith,* Freewill and Moral Responsibility; *Arthur N. Prior,* Facts, Propositions and Entailment; *K. R. Popper,* Corrections and Additions to "New Foundations for Logic."

PHILOSOPHY XXIII 84: *H. D. Lewis,* Collective Responsibility; *F. C. Copleston,* Existentialism; *W. R. Inge,* Theism; *Viscount Samuel, A. J. Ayer, H. Dingle,* Philosophy without Science; *M. B. Foster,* A Study of History; Philosophical Survey: Philosophy in Italy.

THE JOURNAL OF PHILOSOPHY XLIV 26: *Hao Wang,* Notes on the Justification of Induction; *H. Heath Bawden,* We Call It Mind. XLV 1: *D. W. Gotshalk,* A Suggestion for Naturalists; *O. K. Bouwsma,* Naturalism. 2: *John Ch. Simopoulos,* The Study of Inspiration; *Jared S. Moore,* The Sublime, and Other Subordinate Esthetic Concepts. 3: *Paul D. Wienpahl,* Philosophy of Ethics, Ethics, and Moral Theory; *Willson H. Coates,* What is Progress? 4: *Virgil C. Aldrich,* Language, Experience, and Pictorial Meaning; *Joseph Katz,* On the Nature of Selfishness; *Carlton W. Berenda,* Comments on "Metaphysics as Hypothesis."

PHILOSOPHY AND PHENOMENOLOGICAL RESEARCH VIII 2: *H. A. Wolfson,* Infinite and Privative Judgments in Aristotle, Averroes, and Kant; *Jean Hering* (translated from the French), Concerning Image, Idea, and Dream; *Paul Weiss, Existenz* and Hegel; *C. J. Ducasse,* Some Comments on Professor Wild's Criticisms of My Views on Semiosis; *John Wild,* On Professor Ducasse's Ex-

planation of His Theory of Semiosis; *C. J. Ducasse,* Some Comments on Professor Wild's Preceding Remarks; *Jehoshua Bar-Hillel,* The Revival of "The Liar"; *Alexandre Koyré,* Reply; *Patrick Romanell,* The Background of Contemporary Mexican Thought; *Archie J. Bahm,* Rightness Defined; *W. M. Sibley,* Does Naturalism Leave Obligation out of Ethics?

THE JOURNAL OF SYMBOLIC LOGIC XII 4: *Nelson Goodman* and *W. V. Quine,* Steps toward a Constructive Nominalism; *R. L. Goodstein,* Transfinite Ordinals in Recursive Theory; *Hao Wang,* A Note on Quine's Principles of Quantification.

ETHICS LVIII 2: *Hans J. Morgenthau,* The Twilight of International Morality; *A. C. Ewing,* Utilitarianism; *Willis Moore,* On the Nature and Justification of Ideals.

SOCIAL RESEARCH XIV 4: *Alvin Johnson,* The Jewish Problem in America; *Franco Modigliani,* Fluctuations in the Saving Ratio—A Problem in Economic Forecasting; *Hans Speier,* The Future of German Nationalism; *Kurt Riezler,* Comment; *Leo Strauss,* On the Intention of Rousseau; *Fernando de los Rios,* Francisco de Vitoria and the International Community; *Helmut Kuhn,* On "Freedom and Order" (Note); *Eduard Heimann,* Rejoinder (Note).

THE ANTIOCH REVIEW VII 4: *Michael O'Hearn,* "Crisis" at Lake Success; *Milton R. Konvitz,* Morris Raphael Cohen; *Eliot L. Wagner,* Garden of Eden; *Paul M. Gregory,* The Deformed Thief; *Stanley Edgar Hyman,* The Marxist Criticism of Literature; *Kenneth W. Hunt,* Nature's Ne'er-Do-Well; *Morris Watnick,* Toynbee's Nine Books of History against the Pagans; *Charles A. Madison, Louis Filler, Harry Slochower,* The Reader Writes.

THE PERSONALIST XXIX 1: *The Editor,* Dissymmetry, Development and Democracy; *Alfred Stern,* Sartre and French Existentialism; *The Late Constantin Brunner* (translated by *Abraham Suhl*), Report on Man; *M. Bernetta Quinn,* Indian Lament; *Robert F. Creegan,* Laying the Ghost of Behaviorism; *Myron F. Wicke,* Literature and Integration; *Wilbur Long,* The Heterodoxy of Henri Bergson; *Roderick Scott,* Conditions in China.

THOUGHT XXII 87: *Etienne Gilson,* The Glory of Bergson; *O. Halecki,* National Self-Determination and International Cooperation; *C. Grove Haines,* Rendezvous with Destiny; *Geoffrey Stone,* American Life and Catholic Culture; *J. M. Oesterreicher,* Bergson and the Faith; *T. P. Peardon,* Dominion Status Today; *Vincent C. Hopkins,* The Pale Isolation of Henry Adams; *R. C. Hartnett,* Philosophy and Politics; *Barry Byrne,* Philosophy and Criticism.

THE JOURNAL OF AESTHETICS AND ART CRITICISM VI 2: *Frederick S. Wight,* Henry Moore: the Reclining Figure; *Kaarle S. Laurila,* In Memory of Max Dessoir; *Max Dessoir,* The Contemplation of Works of Art; *Harry B. Lee,* The Cultural Lag in Aesthetics; *Paul M. Laporte,* Attic Vase Painting and Pre-Socratic Philosophy; *Henry D. Aiken,* The Concept of Relevance in Aesthetics; *Juan López-Morillas,* Antonio Machado's Temporal Interpretation of Poetry; *Van Meter Ames,* Expression and Aesthetic Expression.

THE REVIEW OF POLITICS X 1: *Waldemar Gurian,* Thirty Years of the Soviet Regime; *Thomas T. McAvoy,* The Formation of the Catholic Minority in the

United States 1820–1860; *Aaron I. Abell,* Labor Legislation in the United States: The Background and Growth of the Newer Trends; *Bernard Wall,* Britain and the Crisis; *Robert Strausz-Hupe,* U.S. Foreign Policy and the Balance of Power; *Cyril E. Black,* The Greek Crisis—Its Constitutional Background; *Frank O'Malley,* The Passion of Léon Bloy.

THE HIBBERT JOURNAL XLVI 2: *R. M. Montgomery,* The Retiring Editor; *W. R. Inge,* An Old Man Looks at the World; *K. R. Popper,* Utopia and Violence; *Richard Tute,* Is Matter Intelligent?; *R. Nicol Cross,* Shall We Reason with God?; *Bernard Phillips,* The Psychology of Irreligion; *Ernst Fellner,* The Psychology of Socialism; *Harold B. Hewitt,* The Eclipse of the Individual Conscience; *John Saunders,* Eclipse of Chalcedon; *D. Mittrany,* Should Christianity Count in International Relations?; *H. L. Stewart,* Are Universities a "War-Casualty"?; *H. S. Shelton,* Alternative Assumptions in Christian Teaching—II; *S. H. Mellone,* Survey of Recent Philosophical Theological Literature.

THE THOMIST XI 1: *Thomas U. Mullaney,* The Basis of the Suarezian Teaching on Human Freedom; *Ignatius McGuiness, Mystici Corporis* and the Soul of the Church; *Leo M. Bond,* The Effect of Bodily Temperament on Psychical Characteristics.

FRANCISCAN STUDIES VII 4: *Allan B. Wolter,* The "Theologism" of Duns Scotus (Part II); *Aidan Carr,* Poverty in Perfection According to St. Bonaventure (Part II); *Dominic J. Unger,* Christ Jesus the Secure Foundation According to St. Cyril of Alexandria (Part III); *Aurelian van Dijk,* The Litany of the Saints in the Breviary of the Roman Curia and the Friars Minor before Haymo of Faversham; *Irenaeus Herscher,* Franciscan Bibliography for 1946.

JOURNAL OF THE HISTORY OF IDEAS IX 1: *Felix S. Cohen,* (ed.) The Holmes-Cohen Correspondence; *Jan Romein,* Theoretical History; *Hajo Holborn,* History and the Humanities; *Philip P. Wiener,* The Pragmatic Legal Philosophy of Nicolas St. John Green.

THE REVIEW OF RELIGION XII 2: *Horace L. Friess,* Editor's Note; *Salo W. Baron,* Foreword; *F. Ernest Johnson,* Democracy and Revelation; *William J. Fitzgerald,* The Idea of Democracy in Contemporary Catholicism; *John C. Bennett,* Modern Protestantism and Democracy; *Mordecai M. Kaplan,* The Place of Religion in a Democracy?; *John David Hughey, Jr.,* Baptists in Soviet Russia.

THE NEW SCHOLASTICISM XXII 1: *John K. Ryan,* The Reputation of St. Thomas among English Protestant Thinkers of the Seventeenth Century; *Miriam Theresa Rooney,* Law as an Instrument of Social Policy: The Brandeis Theory.

ANGLICAN THEOLOGICAL REVIEW XXX 1: *Thomas V. Barrett,* College Preaching; *W. Norman Pittenger,* Contemporary Anglicanism and the Challenge of Our Time; *Granville Mercer Williams,* Principles of Faith and Order (Church Congress Syllabus 49); *Edgar Legare Pennington,* Christianity and Law (Part II); *Cyril C. Richardson,* The Date and Setting of the Apostolic Tradition of Hippolytus; *Arthur Patch McKinlay,* Christian Appraisal of Pagan

Temperance; *Burton H. Throckmorton, Jr.*, The Longer Reading of Luke 22: 19b–20; *Robert M. Grant*, Recent French Literature on the History of Interpretation; *Holt Hutton Graham*, A Footnote to "The Apostolic Ministry"; *Frederick C. Grant*, Nilsson's History of Greek Religion.

THE AUSTRALASIAN JOURNAL OF PSYCHOLOGY AND PHILOSOPHY. General Index, Volumes I–XXIV (1923–1946).

THE AUSTRALASIAN JOURNAL OF PHILOSOPHY XXV 3: *A. Boyce Gibson*, Preface to a Future Metaphysics; *W. M. O'Neil*, Purposivism; *A. M. Ritchie*, Guido de Ruggiero; *Existentialism.*

THE BRITISH JOURNAL OF PSYCHOLOGY XXXVIII Part 2: *J. Nuttin*, Respective Effectiveness of Success and Task-Tension in Learning; *the late Kenneth J. W. Craik*, Theory of the Human Operator in Control Systems. I. The Operator as an Engineering System; *M. I. Dunsdon*, Notes on the Intellectual and Social Capacities of a Group of Young Delinquents; *N. C. Bradley*, The Growth of the Knowledge of Time in Children of School-Age; *M. D. Vernon*, Different Types of Perceptual Ability; *N. H. Mackworth*, High Incentives versus Hot and Humid Atmosphere in a Physical Task.

THE AMERICAN JOURNAL OF PSYCHOLOGY LX 4: *M. Bentley*, Suggestions toward a Psychological History of the Hominids; *P. Worchel* and *Karl M. Dallenbach*, "Facial Vision": Perception of Obstacles by the Deaf-Blind; *R. Harper*, On the Firmness of Soft Materials; *E. Girden*, Conditioned Responses in *Curarized* Monkeys; *E. L. Thorndike*, Semantic Changes; *H. Werner*, The Effect of Boundary Strength on Interference and Retention; *H. Coppock* and *O. H. Mowrer*, Inter-Trial Responses as "Rehearsal": A Study of "Overt Thinking" in Animals; *W. C. H. Prentice*, The Relation of Distance to the Apparent Size of Figural After-Effects.

JOURNAL OF EXPERIMENTAL PSYCHOLOGY XXXVII 6: *R. D. Nance*, The Effects of Pacing and Distribution on Intercorrelations of Motor Abilities; *J. H. Rohrer*, Experimental Extinction as a Function of the Distribution of Extinction Trials and Response Strength; *D. H. Lawrence* and *N. E. Miller*, A Positive Relationship between Reinforcement and Resistance to Extinction Produced by Removing a Source of Confusion from a Technique That Had Produced Opposite Results; *A. I. Gladstone, H. G. Yamaguchi, C. L. Hull*, and *J. M. Felsinger*, Some Functional Relationships of Reaction Potential ($_sE_r$) and Related Phenomena; *W. J. Brogden*, Sensory Pre-conditioning of Human Subjects; *H. W. Karn*, Sensory Pre-conditioning and Incidental Learning in Human Subjects; *H. H. Kendler*, A Comparison of Learning under Motivated and Satiated Conditions in the White Rat.

PSYCHOLOGICAL REVIEW LV 1: *Edward C. Tolman*, Kurt Lewin: 1890–1947; *Robert W. Leeper*, A Motivational Theory of Emotion to Replace "Emotion as Disorganized Response"; *A. H. Maslow*, Cognition of the Particular and of the Generic; *Ivan D. London*, Free-Will as a Function of Divergence; *Raymond B. Cattell*, Concepts and Methods in the Measurement of Group Syntality.

PSYCHOLOGICAL BULLETIN XLV 1: *Richard L. Solomon*, The Influence of Work on Behavior; *Herbert A. Toops*, The Use of Addends in Experimental

Control, Social Census, and Managerial Research; *Edwin G. Boring,* Current Trends in Psychology.

JEWISH SOCIAL STUDIES X 1: *S. N. Aisenstadt,* The Sociological Structure of the Jewish Community in Palestine; *Raphael Straus,* Was Susskint von Trimperg a Jew?; *Max Eisen,* Christian Missions to the Jews in North America and Great Britain; *Aaron B. Seidman,* The First Performance of Yiddish Theatre in America; *Stanley R. Brav,* Sampling Jewish Marriage Data; *Uriel G. Foa,* A Standardized Multiple-Factor of Socio-Economic Status for Jerusalem Jewish Families.

THE MAHA-BODHI LV 9–10: *V. Somasundaram,* The Light of Asia; *B. Dharmapriya,* A Modern View of Buddhism; *P. R. Barna,* The Position of Women in Early Buddhism; *Christina Albers,* Passing of a Great Buddhist; *R. L. Soni,* Buddhist Mission to America.

LES ETUDES PHILOSOPHIQUES NS 2 (1947): *E. Brehier,* Comment je comprends l'histoire de la philosophie; *C. Baudouin,* Signification de l'angoisse; *J. Chaix Ruy,* Les Deux Cités; *G. Tauzin,* Bases caractérielles de quelques architectures poétiques; *J. Feibleman,* La Place de l'art dans la culture; *M. Cobti,* Une Expérience scolaire: le groupe plein Ciel; *J. Holloway,* La Philosophie contemporaine en Grande-Bretagne Travaux de la Société de Philosophie et des Sociétés de Marseille, Toulouse.

ZYCIE NAUKI II 7–8: *M. Choynowski,* The Educational Role of Science; *Watson Davis,* Possibilities of Future Technologic Development; *Janusz Chmielewski,* Some Commentaries upon "Science and Society"; *W. Sobocinski,* History of Law as Compared with History; A Problem of the Classification of Science; *Waclaw Skrzywan,* A Defense of Statistics; *Jan Mydlarski,* The Organization of Polish Science; *Roman Pollak,* Experiences and Remarks of a Seminar Director; *S. Liwszyc-Tomasik,* Organization of Medicine in Great Britain; *Ludwik Sawicki,* The Budget of the Planned Undersecretaryship of State for Questions of Science. 9–10: *John D. Bernal,* Science and the Destiny of Man; *Tadeusz Kowalski,* About the Parliment of Polish Science and the "Group of Immortals"; *Kazimierz Lepszy,* The Problem of the Younger Generation of Scientists in Poland; *Tadeusz Dobrowolski,* The Organization of University Studies in the Field of History of Art; *Bohdan Baranowski,* The Need of Co-operation between Oriental Studies and Polish History; *Jan Muszkowski,* Documentation and Documentology; *Jan Mergentaler,* The Scientific Achievements of Polish Astronomers. IV 21–22: *Jozef Korpala,* On the Social Responsibility of the Scientist; *W. Antoniewicz,* Planning and Financing of Science the Pedagogical Tasks of Academical Schools; *K. Majewski,* Archaeology in Poland. 23–24: *Bogusław Lesnodorski,* The Academical Schools and the Commands of Life; *W. Antoniewicz,* Studies at the Universities, Educational Activities of the Universities; *F. Sherwood Taylor,* History of Natural Science; *Marian Lodynski,* Libraries and the Policy for Librarianship in Connection with the Needs of Science. [Nos. 11–12 listed in Sept., 1947; nos. 13–20 in March, 1948.]

REVUE D'HISTOIRE COMPARÉE N S V 1: *J. Deér,* L'Histoire en Allemagne et le nationalisme (Suite); *J. Bödey,* Les Echos des guerres turco-hongroises dans

la Poésie populaire bulgare; *L. Elekes,* Nouvelle Littérature sur les origines des états roumains.

"Scientia" LXXXII 9–12: *J. Duchesne,* Esquisse du developpement de l'atomistique classique; *V. Ronchi,* Novità nella teoria della visione (Parte Prima); *E. Mameli,* Influenze metereologiche su avvelenamenti collettivi; *K. G. Stern,* Nucleoproteins and Gene Structure; *M. Popoff,* Ueber die Polyploidie bei Pflanzen und Tieren. LXXXIII 1–2: *V. Ronchi,* Novità nella teoria della visione (Parte Seconda); *P. Swings,* Réflexions au sujet de l'astrophysique moléculaire; *E. Rioga Lo Bianco,* La colonización de las aguas dulces por los animales marinos; *C. M. Doke, Bantu,* a Family of Languages.

Giornale di Metafisica Anno I N. 1–6 1946. II 1: *A. Carlini,* S. Tommaso e il pensiero moderno; *M. F. Sciacca,* Esistenza e consistenza; *Paul Archambault,* De l'énigime philosophique au mystère chrétien; *J. Chaix-Ruy,* J. B. Vico et Jules Michelet; *G. C. Braga,* Il "fanciullino" di Cebete. 2: *J. Maritain,* Coopération philosophique et justice intellectuelle; *A. Guzzo,* Immagine e concetto; *J. R. Sepich,* Determinación y alcance del saber metafísico; *R. Jolivet,* Notes sur les théories sociologiques contemporaines; *A. Caracciolo,* L'estetica di B. Croce nel suo svolgimento e nei suoi limiti; *R. Amerio,* Introduzione alla Teologia di Tommaso Campanella; *M. T. Antonelli,* I Sofisti Minori; *J. Collins,* Philosophie aux Etats-Unis, 1940–1946. 3: *J. Maritain,* Coopération philosophique et justice intellectuelle; *R. Lazzarini,* "Status" e "situazione"; *A. Carlini,* Filisofia e scienza; *R. Crippa,* Limite e vocazione; *A. Caracciolo,* L'estetica di B. Croce nel suo svolgimento e nei suoi limiti; *M. T. Antonelli,* I Sofisti in Platone.

Giornale di Metafisica II 4–5: *M. F. Sciacca,* La metafisica e i suoi problemi; *F. Amerio,* Che cosa è metafisica; *G. Berger,* Qu'est-ce-que la métaphysique?; *C. Boyer,* Qu'est-ce métaphysique?; *A. Carlini,* Per la fondazione di una metafisica critica; *I. Collins,* Metaphysics in an Empirical Climate; *M. De Corte,* La Métaphysique et le métaphysicien; *A. Forest,* Convergences doctrinales en métaphysique; *A. G. Alvarez,* La via de acceso a la metafisica como procedimiento para ganar su esencia; *A. Guzzo,* Che cos'è metafisica?; *L. Lavelle,* Epitome metaphysicae spiritualis; *R. Le Senne,* Bréviaire de métaphysique axiologique; *C. Mazzantini,* L'orizzonte metafisico della filosofia della virtualità; *U. A. Padovani,* La metafisica Aristotelico-Tomistica e il pensiero moderno; *J. R. Sepich Lange,* Qué es metafisica?; *L. Stefanini,* La metafisica della forma.

The Maha-Bodhi LV 5–6: *Vappa Maha Thera,* Satta Visuddhi or The Seven Stages of Purity; *Nicholas Roerich,* Seal of the Age; *B. M. Barua,* The Role of Buddhism in Indian Life and Thought; *A. D. Jayasundere,* Why is Dana Not Included in the Noble Eight-Fold Path?; *D. B. Jayasinghe,* Anicca, Dukkha and Anatta; *Francis Story,* Ahimsa in Buddhism; *Piyadassi Thera,* From Passion to Peace; *Bhikkhu Rahula,* Man, His Nature and Destiny; *Tai Chi Tao,* Cultural Bonds between China and India; *Fa Fang,* A Brief Sketch of the Life of His Holiness Tai Hsu. 7–8: *Paul Levy,* Indo-China — A Land of Buddhism; *Anukul Chandra Banerjee,* The Chinese Buddhist Canon; *Debabrata Barua,* Religion a Land Mark.

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